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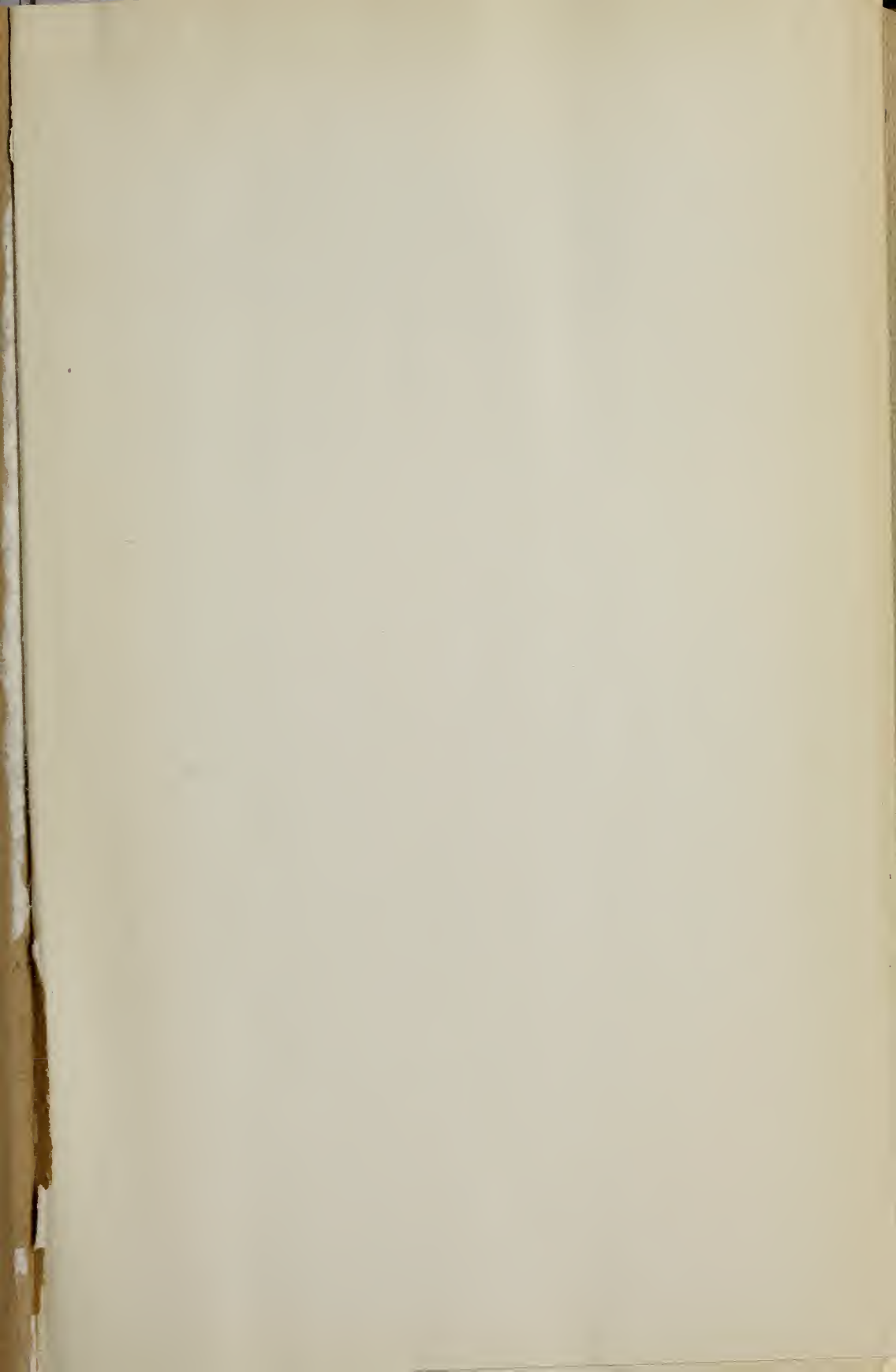
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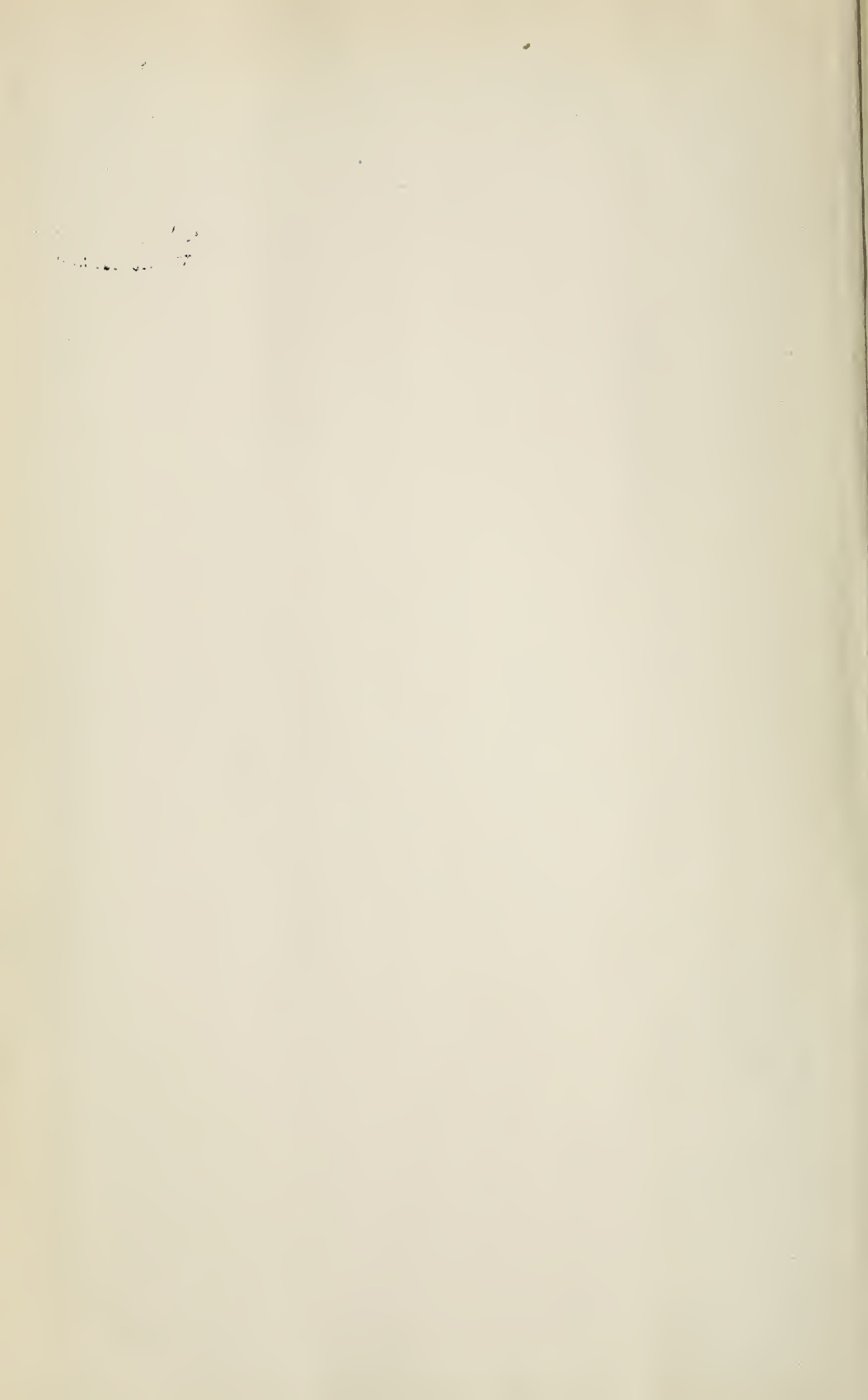
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Vol. XXIV.

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No. 1.



HAPPY New Year!

THE *British Bee Journal* invites a discussion of house-apiaries.

A. B. J. doesn't stand for "A Big Joke," but for the only weekly bee-paper on the continent, *The American Bee Journal*.

A PRIMING COAT of paint, says E. B. Thomas, in *American Bee Journal*, is all wrong. Give hives first a heavy coat of old raw linseed oil.

RAILROAD authorities in France, says *Le Progres Apicole*, were petitioned to sow honey-plants on railroad embankments, and gave a favorable response.

IMPURITIES on the bottom of a cake of bees-wax are troublesome to scrape off. Do the work while the cake is still hot, and it won't be half as hard.—*British Bee Journal*.

THAT TABLE on p. 951 is decidedly interesting, and its value would be increased if we could know whether the colony was above or below the average in numbers.

SOME YEARS AGO I saw at McHenry, Ill., an apiary that was wintered after the manner described by Mr. Coggs shall, p. 945. If I remember correctly, the plan was quite successful.

CAN IT BE that intended marriage is the cause of Rambler's ceasing to ramble? Well, when he gets settled down with Eugenia let him tell us all about what they do with their bees.

IN REPAINTING hives, says E. B. Thomas, in the *American Bee Journal*, if the paint is not actually off the wood, one good coat of raw oil is quite as good as a coat of paint, and much cheaper.

THE MEMORY of the Rev. W. F. Clarke is at fault, I think, when he says, on p. 933, that he never met Mr. Langstroth except in 1871 and 1895. I think I distinctly remember seeing both of them at the Toronto convention in 1883.

FATHER LANGSTROTH wrote to have me try malted milk on bees, and I did so, but I couldn't make out that it produced any effect on the queen's laying. Possibly it might make a difference at a time when bees were gathering absolutely nothing.

HERE'S A QUOTATION from a Louisville paper that's a little out of the usual: "HONEY.—In pound sections, 12½@15c; wild honey, 5@6." [It's no worse than the constant use of "strained honey" in the market quotations of our big dailies. I suspect the commission houses are responsible for this.—Ed.]

HON. GEO. E. HILTON says, in *Michigan Farmer*: "I not only believe there should be a bee-keepers' organization in every county, but in every township; and through the winter months these township organizations should meet monthly at least, and semi-monthly would be better." My! but wouldn't that make a lot of conventions! And a good many would have only one in attendance.

SWEET CLOVER. I challenged the statement, in Dadant's *Langstroth*, that cows would destroy sweet clover. They write that they turned cattle in a field having a patch of sweet clover, "and before the end of the season they had destroyed every single plant, and they have never allowed a stalk of it to grow on this land. Our experience is that cattle will eat sweet clover in preference to any other grass."

REFERRING to that footnote on p. 945, it's bad enough to have my poor joke about my article being run as a serial throughout the new year being taken seriously; but it's still worse to be all torn up with uncertainty in trying to decide whether the editor himself is joking or in earnest. [You didn't label that as "A Big Joke," so I took it in earnest. Say, A. I. R. says your summing-up of the whole subject was the best treatment we have ever had in *GLEANINGS* on wintering.—Ed.]

AN EVENT in London was the presentation to the Lady Mayoress of a representative collection of native honey, contributed by women bee-keepers, or the wives and daughters of beemen in various parts of Great Britain. Object,

to popularize the use of British honey "as an essential article of the household dietary." Might do that here, but who would be the Lady Mayoress? If she of New York were selected, there might be trouble with Mrs. Swift, of Chicago.

CHUCKLING the little bee said,
All tucked away snug in its baid,
"The people will all think I'm daid,
Never again to arise."
Just wait till old winter has flaid,
And skies are again warm and raid,
Out pops the little bee's haid,
And away to the meadow she flise.

THE PROBLEM of unfinished sections troubles a good many; but for the past two years I've had no unfinished sections whatever. I might take this occasion to remark, however, that the number of finished sections has been the same. [I suppose you mean this for another "Big Joke"—on you. Well, you can't feel so very badly, for hundreds of others are in the same boat. Come to think of it, no one of late has written on the subject of unfinished sections. Is it because they have had none?—ED.]

CANDY for winter feed. Here's a recipe given in *L'Abeille de l'Aube*. Dissolve 8 lbs. of sugar in a pint of water; bring to a boil, add 2 lbs of honey, and stir well; add $1\frac{1}{2}$ lbs. rye flour; heat an instant, and mix; let cool a little, and pour on greased paper; then cut, and place in hives. [It's too much trouble to make this. Powdered sugar and honey kneaded into a stiff dough is much easier to make, and why not just as good? Rye flour? I'd rather have it left out for a winter food.—ED.]

"I HAVE OFTEN SEEN, in observatory hives, when there was plenty of room, and the queen did not have to hunt about for cells, a queen lay six eggs in a minute," says Charles Dadant, in *American Bee Journal*. He reasons from this that, if a queen lays only $\frac{1}{16}$ of the time she'll lay 3780 eggs every 24 hours, requiring ten Simplicity frames for eggs alone, and two or three more for honey and pollen, to say nothing about drone comb. [But queens very seldom lay 3000 eggs in 24 hours. They simply couldn't stand it; 1000 eggs in 24 hours during the busy season is a big average, I think.—ED.]

HASTY, commenting in *Review* on the notable article of Prof. Koons, GLEANINGS, p. 699, thinks that we should not put more than 4600 or 4700 bees to the pound until further corroboration. He strongly objects to 20,000 as the average number of bee-loads to the pound. He says, "The best result, a pound of honey to 10,154 loads, is well worthy of a place in our memories and record-books; but the other extreme, a pound of honey to 45,642 loads, is mere smoke in one's eyes." The last, because bees are coming in empty, from exercise, with water, with propolis, etc., that ought not to be counted.



STRAWS OR STOVEWOOD FROM DR. MILLER.



I often wondered why Dr. Miller kept throwing "Straws" at people. Is there no timber near you, doctor? Why don't you "pitch into them" with stovewood? You would not have to throw nearly as often. But, hold! I

mean *your own* stovewood, mind you.

Is the doctor going crazy? On page 618, A. B. J., he actually directs his correspondents who send him questions, *not to inclose stamps*, as he will answer through the bee-journals. Now, I hereby give notice that I am not so high-strung as that. Send on your stamps and questions to me, gentlemen, and I will answer through the bee-papers, and *keep* the stamps. I don't propose to repudiate any of Uncle Sam's paper.

Now, doctor, here is a first-class, fine large fat crow to pick: On page 638, A. B. J., you knocked down one S. N. by striking him square between the eyes with a billet of wood—yes, sir, with a billet of wood, for asking, "Can empty kerosene-cans be used as a suitable package for honey?" You must have been out of reach of your "straw" pile, or a good deal too near some neighbor's woodshed, or you would not have hit him so hard. Did the agony of poor S. N. turn your heart to old oil-cans? Verily it looks much like it. I find, page 701, A. B. J., you transfer from GLEANINGS the pernicious (and, I was going to say, nefarious) advice of S. S. Butler to use old oil-cans for extracted honey. You do this without a single word of condemnation, thus giving it your indorsement in the eyes of all your readers. You know—yes, you know—that the use of such oil-cans is calculated to sink lower and lower the price of all extracted honey. But perhaps it did not strike you in that light at the time. Now, doctor, toe the mark. A few words of explanation are now in order, and for that purpose I yield the floor. But, hold! One word more. This is the age of advancement and not retreat. Old oil-cans have been condemned, rejected, and abandoned.

While oil cans lived
They lived in clover;
But when they died
They died all over.

Don't try to resurrect them, doctor. They are far too dead for that.

When a fellow gets a new idea—gets it just by the tail, you know—GLEANINGS jumps up and "hollers" out, "That is an old tale—that

was used and abandoned years ago;" and, to knock all the vanity and conceit out of the supposed inventor, it goes to work and *proves* it by records in its columns. Here's a case in point. But, Mr. Editor, don't hit the poor fellow too hard. *Leave some of him.*

A GREAT "DISCOVERY."

In the *American Bee-keeper*, page 275, Mr. John Clark says that, while experimenting, he "discovered" a new plan to get the wax out of old comb. Take an old lard or oil can and cut a hole in the side of it as large as the exhaust-pipe on your waterworks. Then fill a basket (I suppose a bushel basket will do) with your old comb. Put a little water in the can. Now stuff in the basket of old comb, and cover with carpet. Now harness it to the waterworks by pushing the can on to the exhaust-pipe. In three short minutes the job is done. If this is *new*, and a splendid success, I want an exhaust-pipe. If you have them in stock, Mr. Editor, send me one immediately, already loaded, mind you. But I think that A. I. Root "knocked the stuffin' out of" old comb years ago, with steam. Is it not so?

HOW TO EDUCATE THE TAIL END OF A BEE.

For two hundred years entomologists have been deceiving us. Two hundred years! and during all that time I have never raised my voice in protest against them. But now it is time they were brought to bay. When I tell you that I intend—

To be remembered, in my line,
With my land's language,

you will see that they will have a foeman worthy of their steel, and one that's not to be fooled with. I draw the line at the worker-bee. I emphatically deny that he is a woman. I most indignantly repudiate the thought. Where are the sweet, tender, gentle, kind, and sympathetic traits of womankind? Echo answers, "Where?" No! he is a male man, or at most he is nothing more than a female man—the most vindictive, fierce, prodding, probing, punctuating, piercing, penetrating, "get there anyhow" kind of a beast that I ever knew. Yes, entomologists have led us astray on his anatomy. The wrong end of the bee is the right end. No, that is not it. The head end is the tail end. No, that is not it either. Now look here. What I mean is, that the entomologists have placed the brains of the bee in his head, whereas I contend that all his intellectual and business faculties lie in the tail end of him. This is the point where you must begin his education. His mind lies in the wrong end of him. The fore part of his body is an automatic machine which was built solely to rear a house and store away supplies. Now, Mr. McArthur, of Toronto, meets my views exactly. In *A. B. J.*, page 653, is an account of a new strain of bees originated by him. They have long and penetrating stings, but never use them. Mr.

McArthur commenced at the head—that is, the tail—of the bee, to reform it. Now, here is where everybody else fooled themselves. They began at the head, whereas I have clearly shown that his whole business force lies in the other end of him. All experiments in reform heretofore have failed—ignominiously failed—because they began at the wrong end. But Mr. McArthur struck a bonanza when he took the same view of it that I do. He began the reformation right, and he succeeded. You can kick his hive over, and then kick it back again, and they make no resistance. You can grab them up by the handful, throw them into the air, and kick them and cuff them as they come down again. Will they fight? No, sir. They will sneak away, back into the hive, and begin to cry. Mr. McArthur doesn't intend to begin selling queens from this strain of bees till their stings rust off for want of exercise, and then he will have a race of stingless bees. Mr. McArthur is still pushing his reformation up the spinal cord. But I think he has gone far enough. If I were in his place I would not try to reform the left end of him; if he does, he may paralyze the honey-gathering machinery. But, won't there be a picnic when the boys of Toronto know for a certainty that Mr. McArthur's bees won't sting? Won't the streets of Toronto flow with honey when the boys know that the bees have reformed? O sweet-scented streets of Toronto! how I should love to be there to enjoy the "feast of reason and the flow of *sole!*" Then will echo from corner to corner, "Run, boys, run! run for McArthur's apiary! all you have to do is to kick over a hive, paw the bees off the combs, and send them home crying to their mother! Run, boys, run! Hurrah!" Oh, the glorious, happy day when the boys will get all the honey, and the bee-keeper—nothing!

Now I just want to offer a little criticism on the above "circuit" of Mr. McArthur. He began right—at the right end—but he went too far. Some of the "reform" must have touched the spinal marrow at the root of the sting, and thus paralyzed it. The reform was too strong, and should have been diluted. I am now going into the "reform" business myself: but you will see a different result. I will begin on their moral nature (which is rather attenuated at present) and teach them to distinguish between friend and foe. I will instill into their innocent minds a love for the family of the bee-keeper. The course of study will be so thorough and so effectual that the children can play "hide and go seek" in the apiary while the little tots are sitting down playing with the bees in front of the hives. Scouts to hunt a home will be abolished, and instead a deputation will be sent to the house to proclaim the glad tidings to the family that a swarm is soon to come out.

But, on the contrary, I will cultivate to the

highest their natural disposition to attack strangers—to regard as a mortal foe every one who does not belong to the family; to whet up their swords every evening, and “welcome the invader, with bloody hands, to a hospitable grave.”

CALIFORNIA ECHOES.

By Rambler.

W. W. Bliss, of Duarte, Cal., a bee-keeper and fruit-grower, is honored with several medals at the Atlanta fair.

Geo. W. Brodbeck, of Los Angeles, also secures a medal for an exhibit of California comb honey.

Not much encouragement to embark in the bee-business here, honey being only 3 cts. per lb., best extracted; comb honey, 8 to 9.

I wish to thank an unknown friend in Australia for sending me a Christmas study in kangaroos. The bachelor kangaroo would be my particular favorite.

We have a law in this State against the adulteration of honey. The penalty is a fine of \$50 or upward. Some of our bee-keepers think that an imprisonment clause should be added to make it more effective.

Just see what Dr. Miller says about pulling out the bottom of a well. Doctor, if you will take a run out here, you will learn more in a week about wells and water and irrigation than you have in all your life before. There are neighbors of mine here in Bloomington who pull out the bottoms of their wells once every week.

Mr. Bonart, of this county, has a large apiary, and a large vineyard on the same ranch, and the vineyard is not injured by the bees. Mr. B. says that one year, when the grape-vines were in bloom, there was a continuation of northerly winds that kept the bees from working upon the whole vineyard. Only that portion nearest the apiary was worked thoroughly; and when grapes ripened, this portion of the vineyard had the most grapes. Still there are people who will complain when a bee looks at a grape.

Some of our California bee-men have a habit of finding fault with their bee-paper when they see any thing in it about wintering bees. But just think of it, friends, in a paper that is published for the whole continent. We get all sides of bee-keeping, and it keeps the reader posted, making him an all-round bee-keeper. A local paper is liable to make a sort of one-sided bee-man, and Californians can not afford to fall into such a rut. Let us take the wintering symposiums good-naturedly, especially when there are 16 extra pages added.

SUNRISE APIARY.

ANOTHER BEE KEEPERS' UNION TO BE ORGANIZED WITH A LIMITED MEMBERSHIP: DRY-WEATHER VINE HONEY SUPERIOR TO THE FAR-FAMED ALFALFA.

By John C. Wallenmeyer.

The exhibit was arranged and decorated by my assistant, Miss Jeanette Lois Millard, and was awarded 1st prize and diploma for being the most interesting and most attractive exhibit of 4:6 at the Tri-State Fair. I secured 1st premium on most attractive display of comb and extracted honey, bees and queens, and apiarian implements. We made \$40 clear by selling honey lemonade, while other lemonade-sellers never made expenses. You might say, if you like, that Miss Millard and myself are going to organize a bee-keepers' union (limited membership of two). We might consolidate with the North American. Miss Millard is just 18, and loves to take care of bees, rearing queens being her hobby. I have leased a 70-acre farm for 5 years, and will have a honey-farm—that is, plant such crops as will produce honey, and pay besides for other things. I will express you a sample of Finch foundation, and a jar of best honey on earth, and seed-pods of the source (dry-weather vine or weed).

THE DRY-WEATHER VINE, OR EVANSVILLE HONEY-PLANT.

The finest honey in the world, considering body, flavor, and color, is produced by what we call the dry-weather vine. It has been pronounced such by experts, who are bee-keepers and honey-dealers, and who have tasted all the principal honeys produced. Alfalfa honey, which is pronounced to be so fine, finds no sale alongside of our so-called “Evansville honey-plant.” There is a sickening odor not unlike perfume, attached to alfalfa. I have sold in the Evansville market, alfalfa, alsike, linden (or basswood), sage, goldenrod, black mangrove, saw and cabbage palmetto, orange-blossom, catnip, buckwheat, and white-clover honey, yet none of the above-named can even be classed with the “Evansville honey-plant.” Test the sample mailed you and I know you will admit all I say of it. It is water-white in color, very thick and heavy in body, weighing 12 to 13 lbs. to the gallon. The flavor is its winning point—very mild and delicious. One never tires of it as you would of basswood. I have some standing in open jars now two years, extracted, and it has not begun to candy yet. I received first premium last year at New Harmony fair, over 13 competitors, with this fine honey. I believe that this will prove to be the most valuable honey-plant ever known to bee-keepers, and I can back up my belief with good reasons. 1. It begins to yield nectar at a time when there is nothing else, usually setting in here July 15. 2. Its length of bloom, as it continues unabated until cut down by the

SUNRISE APIARIES.

J.C. WALLENMEYER PROP.

BEE S

HONEY ALSO BEEKEEPERS' SUPPLIES

PIE EATING
CONTEST
THIS AFTERNOON
NEIL FORD



frost. 3. It flourishes in a drouth. The hotter and dryer the weather, the more abundant the bloom and yield of nectar. One can actually see the tiny drops of nectar glistening in the morning sunlight, at the base of the petals. 4. Its immense yield is its winning feature. It grows on low damp marshy places best, but thrives almost anywhere it gets a start. Once it gets started it is indeed hard to eradicate. We did not get much of a flow from it this year on account of such a rainy season this summer and fall, corn growing 15 to 16 feet high all over the river bottoms. The vine has clusters of flowers about every 6 inches, of about 10 to 20 blossoms, the blossoms being of a light blue color, and very beautiful and fragrant, the aroma filling the atmosphere for miles around. It has seed-pods about an inch in diameter, and about 3 inches long, resembling a pickle. Each seed is furnished with a silk-like tassel; and when the pods burst, the winds carry the seed in all directions. I have leased a 70-acre farm right in the heart of this big honey-producing belt. In this vicinity, every fall, bee-trees are cut by the dozens, and honey gathered by the tubful. Mr. J. J. Cosby, a prominent bee-keeper, stated that, when he examined my locality in the midst of the honey season, were a thousand colonies of bees placed near this locality it would not be overstocked, and he is a practical bee-keeper whose opinion is held very highly by all who happen to know him. So much faith has he in the honey flora of this locality that he has purchased a beautiful piece of ground within half a mile of me. All the above facts are vouched for by such prominent bee-keepers as J. J. Cosby, M. Hessmer, B. Wither- spoon, and Mr. Wheeler.

Evansville, Ind., Nov. 23.

[I have, as stated, before me a fine sample of the dry-weather-vine honey. While it is beautiful in body and color, its flavor being very fine indeed, I do not think it quite up to some alfalfas we have here. Perhaps in time I should like the other better.]

As to that bee-keepers' union, I am sure our readers will unite with me in wishing it all manner of success. We need a good many more such unions, especially in California. Mr. W. is the author of that song, Queen Jeanette. There, you know who she is now.—Ed.]

EUROPEAN AND OTHER MATTERS.

THE BEES OF THE CAUCASUS, ETC.

By Charles Norman.

In the European bee-papers now and then mention is made of the bees of the Caucasus; but I never could get hold of a description of them. Mr. Edward Bertrand satisfies my curiosity at last, for he describes them in the November number of his *Revue Internationale*. There are two races of them, a gray one and a yellow one. The gray ones occupy the whole

northern and mountainous part of the Caucasus, and extend some south of Tiflis; while the yellow ones inhabit the province of Erivan and Russian Armenia.

In the region of Elizabethtopol the two races are mixed. Their color varies in intensity according to the different regions. The southern variety is of a brighter (the French expression is "plus franc") and clearer yellow than the Italians are, while the gray bees are rather clearer than our common bees, and approach in aspect to the Carniolans a little. Both of the varieties are exceedingly gentle, and can be managed without the use of any smoke. Mr. Bertrand received one of the gray queens from "Mr. M. N. Schawroff, directeur de la Station Séricole et Apicole" at Tiflis. I give you the gentleman's address in French, so that if you or some of your readers would like to communicate with him, a letter with the French address will certainly reach him.

CROSSING *APIS DORSATA* WITH COMMON BEES.

Dr. Miller reports in one of his *Stray Straws*, Nov. 15, that Mr. Vogel, a German bee-keeper, "scouts the idea of crossing *Apis dorsata* with the common bee; and in a footnote you remark, "Who said they could be?" Well, if you lay stress on the word "could," you are fully right; for there is no bee-keeper who says that they *can* be; but there are some—and none of the minor ones—who most assuredly say that they *may* be. For instance, your friend Gravenhorst, who devotes nearly three columns of the November number of his *Illustrierte Bienenzeitung* to the subject. He says that Mr. Dathe, at Eystrup, Germany, and Mr. Frank Benton, at Washington, are the only real bee-masters that have observed and studied the said bee; and both of them, he continues, are of opinion that crossing it with *Apis mellifica* is possible. In GLEANINGS of Dec. 1, E. R. R. remarks: "Frank Benton says it is impossible." Explain, please. When Mr. Benton returned from

[I can not at this moment refer to the place; but I think Mr. Benton said somewhere that the idea was absurd. Will Mr. Benton please enlighten us? Mr. Gravenhorst is a bee-keeper whose opinions I value, therefore I should like to be set right.—Ed.]

the East Indies he sent Mr. Gravenhorst about a dozen samples of *Apis dorsata*, some of them being workers, some drones. The only difference from our bees consisted in size and color; they were bees and nothing else; had not the least resemblance to the wasp and the like. The workers are as large as a well-grown after-swarm virgin queen of ours; and as to color, the only obvious difference between them and a genuine Egyptian or a beautiful Italian bee is that their wings show an azure tint or hue. The drones, not only in shape but in size, are like our largest drones. *Apis dorsata* produces wax in the same way our bees do, and their honey is equally good. That little difference in color is no proof against the possibility of crossing; for can not the black and yellow bees be cross-

ed? And as to size, can not a small pony be crossed with the largest race of horses? or our common hen with a China rooster? To be sure, *Apis dorsata* does not build its comb as our bees do. It makes only one large wheel-shaped comb which it attaches to the branch of a tree, or below some projecting rock. It also leaves its home and migrates when nectar is missing; but all this hardly excludes the possibility of a *crossing*. Therefore Mr. Gravenhorst thinks that the thing should be tried, as the result might be of great practical as well as scientific importance.

DOES THE FOOD AFFECT THE TEMPER OF BEES?

It is a mooted question among bee-keepers, as to whether the food which is given to the larvæ of a colony determines their character; or, in other words, whether the larvæ from a gentle queen, when placed in and fed by a vicious colony, will become less gentle, and *vice versa*. Mr. Bertrand formerly believed in this kind of so-called "heredity," but he takes it all back now, after experimenting in this line with his gray Caucasian queen. He selected a very bad and vindictive colony of his, killed their queen, and replaced her by the Caucasian queen on the 24th of August, 1894. She laid splendidly, and her colony was the strongest and most advanced of all in April, 1895. And her bees? well, they were remarkably gentle; and, although Mr. Bertrand never used any smoke or veil when he worked with them, yet he never received a solitary sting from them. The experiment, of course, is only a single instance, and "one swallow does not make a summer;" yet Mr. Bertrand's prior opinion is thoroughly shaken by it. The force of the argument, I might add, is increased by the fact that these foreign races, when transferred to other countries, often *lose* their gentleness. The Egyptian bee, for instance, hardly ever uses its sting "at home," while, when taken to Europe, it becomes very bad (*Revue*, 1894, page 211).

NOMENCLATURE OF QUEEN-CELLS

The other day, when rambling through some back numbers of GLEANINGS my eye struck, and I reread, quite a thorough article from Dr. Miller's pen on "Queen-cells of two Kinds;" viz., such as are constructed *before* the eggs are laid in them, and such as are constructed into queen-cells *after* the eggs are laid. The former are built as queen-cells by the bees from the start, and called *pre-constructed* cells by the doctor. The latter are worker cells which are changed, widened, transformed into queen-cells, and called *post constructed* cells by him. It is important for the bee-keeper to know and notice the difference; and, in this particular, you, in a foot-note of some length, fully agree with the doctor; but you object to the terms "pre-constructed" and post-constructed," as you are "rather opposed to the use of Latin

prefixes in the coinage of new words that could not be understood by the general reading public." Now, leaving out the questionableness or non-questionableness of this argument of yours, there might be some other reason or reasons that could be preferred against said terms. One of them seems to be their length. Americans like short words and expressions, and those two terms are decidedly too long, provided shorter ones can be given in their stead. At first I thought whether it might not do to say "pre-cells" and post-cells." But then your objecting to the use of Latin prefixes! When thinking the thing over, all at once two words rose before my mind—the words "forenoon" and "afternoon," and then came the words "forethought," "afterthought;" "forepart," "afterpart," etc. So I ask you, as well as the doctor, Shall we not name said cells "fore-cells" and "aftercells"?

[This would be better.—ED.]

AN "INFALLIBLE" METHOD OF INTRODUCING QUEENS.

Do you want to learn an *infallible* method of introducing queens? Well, according to the November issue of the *Leipziger Bienenzeitung*, Dr. Metelli, that well-known Italian bee-master, pretends to know and practice one. First he prepares the colony which is to receive the queen. If they have neither queen nor brood, the bees are contracted in the brood-nest on as few combs as possible, the upper story is emptied of its honey frames, and the two stories are separated by a bee-tight wire net, such as can be removed without difficulty. If they have any brood (even *unripe* queen-cells) it is not removed, but they are likewise contracted in the brood-nest. If they have a queen, the same is taken away, and care had lest another laying or virgin queen be present; then contraction as above takes place. Second: Now two or three brood-combs, with the queen and all the adhering bees—the more the better—are removed from another colony and hung in the upper story, with the addition of two empty combs (containing, if needs be, a little pollen and honey), one on either side of them. After 48 hours, the wire net is removed. After 48 hours more, the frames from the upper story are hung down in the brood-nest, the queen having descended quite often ere this. The upper brood-frames, without the queen, of course, may afterward be returned to their former hive. If the colony is a drone-laying one, more care is required. *All the combs* must be removed so that no eggs can be laid, and the colony be put in "swarming condition." Then when the queen, etc., are put in the upper story, the lower colony clings to the wire net in the shape of a swarm. After 48 hours the net is removed, and, after two days more, the frames are taken down to the brood-room. In all of these cases the queen is never hindered in lay-

ng. Has she been sent from abroad, a nucleus has to be formed, and, after it has accepted the queen, management is the same as above. Dr. Metelli, of course, knows the other modes of introduction too, but this one, you understand, is the *infallible* one.

[We have been taught, and rightly, that nothing will work infallibly with bees; that they do nothing invariably under all circumstances. The plan, however, looks as if it might work *almost* infallibly.—Ed.]

FORMIC ACID FOR CURING FOUL BROOD.

Mr. G. Lichtenthæler, of Herdorf (*Leipziger Bienenzeitung*), is not afraid of foul brood at all. What he has to say is this: Foul brood is caused by the bacillus alvei (detected by Pastor Schoenfeld). It can be produced by direct infection; but it can also be produced without direct infection. Give a colony more brood than they can cover; and if they don't empty all the cells containing dead larvæ (after 48 hours) you will, after about 24 days, notice that well-known brown mass. A single foul-brood herd produces so many billions of bacilli alvei that the air of a whole continent could be filled with them. It is the air which spreads the spores of the bacillus. They exist anywhere in the air; they exist in any hive, perhaps even in the intestines of any bee-larva, just like other bacilli. But what withholds infection is formic acid, that most excellent antiseptic. As long as a colony is in a normal condition, it is safe (except from *direct* contact with the germs); but when in an anomalous condition (uncovered brood, food not being honey, but some substitute that contains no formic acid and the like), the case is different. To cure foul brood, Mr. L. applies none of the usual remedies. When 30 to 50 per cent of the brood is foul, all the brood is cut out and burned. Then the potency of the formic acid is increased by contracting the colony to a third or half of its former space, and not leaving any opening except the entrance. After this, abundant well-capped honey-stores are given, and the colony left entirely alone for one or two months. Even if the foul brood is not removed, a cure will be effected; but then it takes three months.

[Foul brood can not start of itself without germs. These germs may *perhaps* be plentiful enough in the air to make the presence of even dead brood a source of danger. Still we have had numerous cases of dead brood as a result of chilling in early spring, and no infection was ever started.—Ed.]

PREVENTING THE UNITING OF SWARMS.

Mr. Maurice Bellott mentions in the *Revue* a way of preventing the uniting of swarms, which oftentimes may be used. He says: "One day an idea struck me; a swarm was in the air, another was about to issue. I quickly close the entrance with a handful of grass, and carry the hive about 200 meters away. I open the entrance, the swarm rushes out, and locate without mixing with the other. Likewise on another day I managed several colonies with the same result."

CALIFORNIA HONEY EXCHANGE.

ITS ADVANTAGES TO HONEY-PRODUCERS; AN OUTLINE OF THE PLAN, AND ITS METHOD OF OPERATION; THE CALIFORNIA CITRUS FRUIT EXCHANGE, AND WHAT IT HAS DONE FOR THE FRUIT INTEREST OF THE STATE; LOW PRICES OF CALIFORNIA HONEY; THE CAUSE AND REMEDY.

By Prof. A. J. Cook.

It is a principle of political economy that prices are regulated by the law of supply and demand. If the supply of any commodity is great, more than is required to meet the usual demand, then prices fall; but if there is a shortage in the supply, or if for any reason there is an increase in the demand, then prices are advanced. This seems right and reasonable, and speaks no hardship. If the producer has an overwhelming abundance, he can face low prices with equanimity; and if his product is scarce, and the price is correspondingly great, he still sees justice in the relation, thinks not to murmur, and is at peace. In truth, he prefers, if he considers only his own selfish interests, to produce, say, 1000 bushels of potatoes, and sell them at one dollar per bushel, than to raise ten thousand bushels and market the same at ten cents per bushel.

In the honey market, this law does not seem to control. Last year there was in California almost no crop of honey, and yet the price was about the same as at present, although many bee-keepers the present season have produced upward of thirty tons of the best honey. It is evident, then, that the markets are manipulated, and that the legitimate laws of trade do not control in fixing the price of honey. The large dealers either keep up the supply of so-called honey irrespective of the production of the genuine article, or else, made strong *through organization*, they have power, which they seem not slow to use, to fix prices to suit their own sordid desires for gain; and thus the producer becomes the victim of what is virtually a great trust, made powerful through the fact of organization. That the latter explanation cuts the larger figure is shown in the fact that the consumer is not benefited by the low price offered by the wholesale dealer, or at least but slightly benefited, for in the retail markets the price suffers no such extreme diminution. Thus the price of honey is manipulated arbitrarily, not controlled by the laws of trade, and this to the serious hurt of both producer and consumer.

We can not wonder, then, that producers are becoming indignant at such palpable injustice, and are resolved "to fight fire with fire." They propose to adopt the motto, *Similia similibus curantur*. All other crafts organize to work as a unit, why not we? say they. They have been united, and able to take advantage of our isolation and scattered energies. Why not we

combine, who produce what the world needs, and will die without, and so compel justice in trade? The others all agree that we do not get our fair share of the world's goods. But as the carver at the table reserves the largest, fattest slice for his own plate, so they, still in the face of acknowledged injustice, fix the price at the lowest possible figure, simply because they can; or, in railroad parlance, "charge all that the traffic will bear."

The orange-growers of Southern California faced this problem. They organized as the Citrus Fruit Exchange only two years ago; yet only last year they controlled the market and shipment of over one-half of the eight thousand carloads of oranges shipped from Southern California. They have largely reduced the expense of packing and shipping, have been able to grade the fruit more perfectly; and as "nothing succeeds like success," they are more and more winning the respect of all classes, and especially the growers; and, unless they commit some most unfortunate blunder, will soon draw all producers into the Exchange. Thus organized they can not only pack and ship at the lowest expense, but they will wield a power that will compel reasonable freight rates, and, best of all, they will restore to the throne, in trade, the great and equitable law of supply and demand. The markets will no longer be manipulated, and the charge be regulated by the endurance of the traffic, but regulated by the just laws of trade, to the benefit of both producer and consumer. The avarice of the tradesman shall no longer fix the prices, but the producer shall have a word as to what price his products shall command in the market. Already the fruit interests are brightening; already the orange-grower is cheered by the hope of living prices; already the whole fraternity is seeing a brighter, better future.

The plan of the Citrus Association or Exchange is something like the following: A central office, at Los Angeles, controlled by general officers, elected by all the stockholders, according to amount of stock, looks after all the general business. This management is in daily communication with all the markets supplied, in the East: arrange with responsible business firms that do business in all available markets, and receive all orders for fruits. As the markets are worked up before time of shipment, the orders come in liberally, and are supplied in proportion to amount of fruit, by the local branches of the Exchange. Each locality has its branch, and, upon receiving an order from the general manager, orders from each individual, as the quantity and ripeness of the fruit suggests. The vantage ground is just here; markets are worked up, and new ones established before the fruit season opens; and that by persons directly interested in the marketing of the fruit at good prices. Shipping is done

by a single body, and so no market is glutted. Cars of fruit go direct to all markets, and not to some one large market like Chicago, to be reshipped. The growers can pack at very much less expense, and have voice as to price. They are not at the mercy of myriads of buyers, often commission men, without means or responsibility. The freight rates are also more sure to be justly regulated by an influential association than they could be by mere individual effort. The thousands of dollars of rebate on freight will also go to the producers and not to the commission men, as was the case under the old *regime*. The grading is done by interested experts, and so is better performed, and constantly builds up rather than interferes with the market. In fact, the whole scheme is a business arrangement, and is rapidly growing in favor, as it must certainly do, commanding the respect of the producer and also of the general business public. Even bankers, and other men of business sense, speak of the Exchange as the salvation of the fruit interests of California, and this at two years of age. If the mere plantlet gains such respect, what will be the result when the plant is mature and has fully fruited?

Bee-keepers are as great sufferers as were the fruit-men, and have precisely the same grievance. Very unjust discrimination is made by the railroad against honey. The best extracted honey, which should never sell below six cents per pound, commands now only three cents in the market; and the bee-keeper whose circumstances compel immediate sale can get no more. He has no option, and is wholly at the mercy of the buyer; and often, very often, fails of all profit; and frequently, trusting his goods to unprincipled commission men, loses every thing. The bee-keepers have resolved to organize a Honey Exchange similar to the Fruit Exchange. A committee of able, wide-awake men, is appointed to put the scheme on foot. The bee-keepers everywhere are promising to become patrons, and show their faith, by the promise to be responsible for all necessary expenditure.

The probable scheme will be to organize an association much like the Citrus Fruit Exchange. A general manager will devote his entire energies to the development of the market, and the honey of California will nearly or quite all be marketed through the central Exchange, and sold directly to large reliable dealers in the East, and at a living price insisted on by the Exchange. If the bee-keepers hold together they can have much to say in regard to fixing prices; and may so influence freight rates that the unjust and unreasonable charges shall be greatly reduced. It is proposed to have one or more local organizations in each county, to determine the magnitude of the drop, and to attend to the grading and ship-

ment, according to advices received from the central organization.

It is believed that this scheme is entirely practical, and already there is a spirit of hopefulness among bee-keepers that could not exist when all the profits went to the middlemen, or, as is too often the case, more than the profits went to unreliable and dishonest commission men.

The fact that all or nearly all bee keepers are intelligent, reading, men, and are united, through the influence of the excellent bee-papers, makes it possible that the Honey Exchange will more readily secure full co-operation among bee-men than has the Fruit Exchange among orange-growers.

Every honey-producer in California should at once write to Secretary J. H. Martin, Bloomington, San Bernardino County, California, giving him the number of colonies of bees in his apiary, the amount of his present crop, and also the names and addresses of all the bee-keepers in the region. This will greatly hasten the work of the committee in putting the Exchange into complete working order.

Claremont, Cal., Dec. 12.

[This is a very important subject. As Prof. Cook truly says, "Nothing succeeds like success." If the Citrus Fruit Exchange had not left such a splendid record of its work during the two years of its existence, we might look with some hesitancy on the efforts of bee-keepers to protect themselves in a similar way. I hope the foregoing article will be read carefully by every honey-producer, not only in California, but in every State in the Union; and I trust, too, we may have the subject more fully discussed by others who may be interested. GLEANINGS will be very glad to assist in the enterprise in any way in its power.—ED.]

SIX YEARS' EXPERIENCE IN SELLING HONEY FROM A COMMISSION HOUSE.

THE IMPORTANCE OF HAVING A NEAT AND ATTRACTIVE PACKAGE.

By S. T. Fish.

Mr. Root:—If you will give us the space in your valuable paper we will speak candidly our opinion, formed after having a honey department for six years. We have several departments in our business, and honey is by no means classed as a large department. Ever since we first went into the honey-business we have had a honey-room which in winter we keep heated with a coal-stove. Since the inception of this department we have endeavored to perfect it for the handling successfully of all our receipts. Aside from the extreme West there has been no honey crop this year.

The last of August we bought a car of comb honey produced in California, from a middleman who makes it a business to pick up small lots and ship a car. This honey was sold to us to be in the regulation shipping-crate, all fan-

cy white, made with separators. We paid the draft; and when we looked at the honey we found some of it was in cases that had $\frac{1}{2}$ -inch boards on each side of the case to fill it out, and $\frac{1}{2}$ -inch boards on the top of the sections, as the case was too deep for that size of section. Some of the sections were woven so that we could not separate them, and certainly this honey was not made with separators.

Right here we want to say that it is to the interest of every bee-keeper to buy a perfect case for his honey—to make separate grades, using a letter for each grade, and not try to deceive any one when they ship. GLEANINGS should continually harp on the topic of "perfect cases." We strongly advise using such cases as are made by the A. I. Root Company, or any other firm capable of making them as good.

Oct. 26th we bought two cars of Utah comb honey, and paid cash, about \$5000 for the two cars. No other firm in this city dared to risk a venture of this kind, considering that Utah comb honey candies very easily in cold weather. We hope that at any future time when Utah puts up comb honey they will leave out sections that are not capped, as, when we show a customer a case, and any of the sections are not capped, it causes trouble, and it is just as convenient for the bee-keeper to keep that honey, and make a separate grade of it. We also notice in these carloads, one bee-keeper broke the comb with his finger. No doubt it occurred in scraping the sections. We want the bee-men to mark the gross, tare, and net on each case of honey. They can ascertain the tare of the cases by weighing several of them separately.

One California bee-keeper sent a car of honey to this market, and wanted us to pay his draft (which with the freight made over \$2000), without being permitted to inspect the car. No firm in the United States would do this. We had no objection to paying the draft, if we could see what the honey looked like; but his instructions to the railroad were, not to allow inspection; we therefore had our suspicions as to quality.

The word "commission merchant" has been so scandalized by irresponsible firms that it is no wonder that bee-men are cautious in their shipments. Recently we observed a commission firm well spoken of by a bee-paper, and we doubt whether this firm has any rating in the mercantile agencies.

Let us sum up this article by saying that it is to the interest of bee-keepers, in putting up comb honey for market, to have a neat package; to grade their honey carefully; for if it is not graded, the poor honey is liable to sell the good honey; and whenever good honey sells poor honey, you can depend upon trouble or a deduction in price.

We have been successful in having a certain

party in Chicago put up extracted honey in glass bottles. He is selling to the grocery trade, and we can now say that it is possible for the consumer to procure pure honey in small packages. This is something that we could not say a year ago.

Adulteration is the enemy of extracted honey; poor package and poor grading is the enemy of comb honey. Overcome these facts, and a much better market will be found for the disposition of the product of the apiary.

Chicago, Ill., Nov. 5.

[Comb-honey producers make a serious mistake in shipping their honey to market in cheap or poorly made or home-made cases. Another serious mistake, and more common than many would suppose, is the lack of grading. As the years go by, we trade more and more supplies for extracted and comb honey; and many of you would be surprised to see the slipshod way in which honey is sometimes put up. We very often buy such honey at a low figure, and can afford to recrate and regrade the entire lot, and then make a fairly good profit besides. Now, what is the use of the honey-producer losing this margin of 3 or 4 cts. a pound when he might just as well save it by spending a little time himself rainy days, when he could do nothing else? If the producer is not going to take time to grade his honey, and properly crate it, the commission man will have to do it, and absorb the profit, because the trade don't want and won't have poorly graded honey except at quite a reduction in price.]

Yes, indeed bee-journals ought to "harp on this subject" a good deal. When the proper season comes for its consideration, GLEANINGS proposes to have a symposium on the subject of shipping and grading honey, made up of articles from honey-producers and commission men.—Ed.]

NOTES AND COMMENTS.

By Mrs. L. C. Artell.

Another year has passed, and our bees, 120 colonies, have gathered only about 400 lbs. of surplus, but they have filled up heavily for winter, so we had no feeding to do, and the bees look healthy, as if they might winter well.

BEEES DON'T PAY.

This is the remark I often hear; but as we do not have to put much time upon them poor years, and I do the most of that work myself, it gives me a good excuse for being out of doors, which is a great benefit to my health, and a great deal of enjoyment besides.

SPRING FEEDING.

Had we not fed heavily last spring I should not feel that 400 lbs. was small pay for my work. I think bees have paid us less this year than for many years, and yet farmers seem to make no large profit on any thing late years. It is only the careful saving of every thing, and selling what we don't use ourselves, that gives any profit in farming.

Our honey is not so nice-looking as in other years, as the bees did not seem to care to build comb, using only sections already drawn out,

so that we are asking but 16 cts. wholesale and 18 retail.

WET YEARS ONE IN SEVEN.

That is what an old gentleman a few days ago said he had observed in his past life—if not a really wet year, yet more rain fell once in seven years. A want of moisture, I think, is the only reason of our honey failure in this locality. The ground is very dry down 20 feet. Nearly every one owning wells has had to dig deeper, and some have dug broader and deeper. The white clover has been scant and thin for years, and but very little along the roadside that used to be white, but they say it looks better this fall than last. Last year our bees gathered some from red clover, but not much this year. Sweet clover is working in along the roadsides, but the farmers mow it down all they can well get at, seeming to think it a bad weed. I had a small patch of sweet clover in my back yard that I kept trimmed about 2½ feet high. It was beautiful with its many white flowers for weeks in blossom, and filled the air with fragrance. Bees worked on it as long as it was in blossom, which lasted until frost, though not many bees were on it at any time.

OUR SCARLET CLOVER.

This, sowed the first of October, covers the ground beautifully where it is out of the reach of the chickens. We sowed some in the orchard twice, and tried to keep the chickens out; but they would steal in one way and another, and pick off every leaf as fast as it appeared, paying no attention to the young oats that were sown at the same time. We also sowed a small patch in our front yard, near the road, for a flower-bed, and to attract attention from passers-by, where we had only small chickens, but they too keep it all picked down, only as I have a part of it covered up with slatted boxes; but as fast as it grows high enough so they can reach it through the slats they take every leaf, showing it would be well to raise it for poultry as well as for bees.

BUCKWHEAT NOT RELIABLE.

Buckwheat failed again as a profitable honey-plant. A few hives of bees near a ten-acre field did not seem to get more honey than bees that could not reach it. Our field was hardly worth cutting for grain.

WINTERING BEES.

Since we gave large entrances at the sides of the combs by raising one side of the hive, and putting under a half-inch block (our hives are not nailed, but clamped at the corners), we have lost no colonies if they were in proper condition when put into the cellar with queens and sufficient honey. From three or four, when being piled up in the cellar, the block came out, letting the sides down, which gave them only their front entrances at the ends of the combs. They all came through in bad condition, and most of them kept dwindling down, and died

before white clover came, showing that close confinement makes bees unhealthy. We generally leave the honey-board on top of the frames, and lay on the second honey-board; the slats between make a dead-air space. They were set in the cellar about the middle of November. We like that time better than to wait longer, unless warm weather continues. In that case we watch the weather, and set in with the coming of a cold wave.

WEAK COLONIES.

We do not try to winter any more, but unite; but on the weakest ones, in point of numbers, of the good colonies, so far as we can judge, we tie a red string, and set them in the center of the cellar, and leave them in the latest in spring, not leaving any later than the 1st to 10th of April. Several springs, our cellar being so full, we would take some out the middle of March, and once the first of March, so we could keep the rest cool enough until about the 1st of April. Then we took out the greater part, but left some few in until the last of April. The last ones taken out gave but very little surplus honey, not having built up into strong colonies soon enough. Those taken out the first and middle of March were better than those left in until the last of April.

OUR CELLAR.

This is 20x20. We find by repeated trial that that size keeps the temperature about right for about 80 or 90 colonies, one year with another. A few colonies in a large cellar are too cool and damp—something like a few bees in a large hive, or a few bees on too many combs; and if there are too many colonies in a small cellar, the bees often get too warm, and become uneasy, and flit out too much. One needs to learn just about how many colonies he can keep profitably in his own cellars, as no two are of equal temperature.

OUTDOOR WINTERING.

We have tried many ways of putting up our bees for wintering outdoors, and find no other so good as Moses Quinby's plan—the originator of our large hives—that of setting the brood-frames an inch from the bottom of the hive. We set them upon a frame, and reverse the brood-frames in the hive, and cover all with two or more thicknesses of carpet, and fill in all around the brood-frames with dry chaff, and on top. At the sides of the brood-frames are thin division-boards to keep the chaff from getting in among the bees. We used to tip the hives forward by setting a brick on end at the back side of the hives, while the front stood on a brick laid flat; but we find, if there is a long cold spell, the bees that drop down in the hive, and die, are more apt to close up the entrance, and there is no advantage in tipping up, as the dampness is absorbed by the chaff. If the entrance is not clogged, the bees will drag out the few dead ones when a warm spell comes.

If the bees are covered by a board, the dampness will gather upon the board and run down in front, clogging the entrance with ice more if pitched forward. If left level it drops down upon the bees; if slanting backward it leaves the entrance clear, but is more difficult for the bees to keep the dead ones dragged out; and if it were not for swaying the combs to one side, the slanting of the hive to one side would be better where a board is kept over the bees; but we very much prefer, for outdoor wintering, hives packed with dry chaff. I would emphasize the word *dry*—not wet or green chaff. All packing should be dry, whatever it may be. When we first began keeping bees, for several years we used buckwheat chaff after it was thrashed, and it would often be quite damp, with some green stems in it, and the covers were leaky. We lost a great many colonies then each winter. Since then we have dry oat chaff, gathered up direct from the thrashing-machine, and kept in the barn until wanted, and have covered our roofs with sheet tin, and painted them since then; and, other conditions being right, they have wintered much better.

CALIFORNIA HONEY.

Our stores are being flooded with a sweet that is called "California honey," put up in glass tumblers, retailing at 10 cts. each. Each glass has a small strip of comb honey, and filled with liquid syrup that does not taste like honey, yet possibly there is a small quantity mixed with the syrup that tastes more like corn syrup with a little honey stirred in than any thing else. On the glass it says, "Put up by" a certain man in Chicago, in small letters; but "California" is in large bold letters. Possibly the strip of comb honey came from California, but I doubt whether the rest did, as it could not be sold so cheap; yet our storekeepers claim it to be California honey. They say that it tastes exactly like sage honey. Its selling so cheap makes slow sale for our pure honey.

Roseville, Ill.

[California sage extracted is now selling for 3 cents in California. The car freight rate is about 1 ct. per lb. The jars at wholesale would cost the jobber about 1½ cts. This would leave only about 1½ cts. for putting up and labeling. It is possible for this honey to be pure, but it is probable that it was doctored a little, perhaps in that "wicked city of Chicago." Kindly send us a sample by express and we will investigate and report.—Ed.]

DIVISIBLE BROOD-CHAMBERS.

QUEENS OCCUPYING TWO STORIES; AN IMPORTANT POINT TO CONSIDER BEFORE SHIPPING HONEY TO THE CITY MARKET.

By Dr. C. C. Miller.

The discussion that started with trying to determine the proper size of hives seems to have widened sufficiently to take in the form and kind of hive. On page 628, J. E. Hand ad-

vocates the divisible brood-chamber as the only hive that has given him perfect control of his bees; and on the very next page the man who has, perhaps, used it longer than any other, denounces it, and holds up another hive that turns work into play.

However honest they may be, it's hardly possible they can both be right, and I may be excused for doubting whether either one is right. The tendency to doubting is increased with regard to Mr. Hand by the very broadness of his claim—the claim that the divisible brood-chamber gives him perfect control of his bees. I am not sure that I ever read or heard before of any one having perfect control of his bees. When my bees take it into their heads to make preparation for swarming, I can, like Mr. Hand, say to them, "Thus far shalt thou go, and no farther;" but the great trouble is, that they don't always mind what I say. I doubt if his are much more obedient. He goes scarcely a word farther than to say he has made a perfect success with no other than the divisible brood-chamber. But others who have made the same trial give exactly the opposite testimony. Whose testimony shall prevail?

So far as my own observation is concerned, I agree with him that queens will pass readily from one story to another, the trouble I reported about getting a queen to lay in a second chamber being when she was confined there against her will.

SOMETHING RICH.

J. L. Anderson has handed me a clipping of more than a column from the *Chicago Inter-Ocean*, being an article copied from the *St. Louis Globe-Democrat*. It is "A Naturalist's Story" from his own observations of the mating of birds and insects. Here's the part that refers to bees:

At or about the time the queen-bee feels the first promptings of love, and before she takes her flight from the hive in search of a lover, the drones may be seen any bright day congregated about the entrance of the hive, or making short and purposeless flights in the vicinity. They remind one very forcibly of the youths one sees loitering about church-doors or at the entrances of theaters, awaiting the outcomings of their sweethearts. The drones are much handsomer than the workers; their markings are different, their colors are more vivid, and their bodies are more graceful. I have repeatedly noticed them on the footboards of hives, walking slowly and sedately up and down, or making queer little waltzing movements, vibrating their wings in a rapid and agitated manner. When the queen flies forth she is immediately surrounded by a bevy of drone lovers.

Her choice of a lover may be the result of an accident, but I do not believe this is the case on all occasions. A queen and drone once fell at my feet, and, upon examination, I found that the queen was using her sting vigorously and effectively. The drone soon died, whereupon the queen abandoned him and accepted another lover before she disappeared from my sight. This seems to me to indicate that the queen exercises, on occasions, the right of choice.

How's that for richness? I think I'll not spoil it by further comment.

FIXING PRICES IN HOME MARKET.

G. M. Doolittle gives some excellent advice

about marketing honey, on p. 633, among other things advising to sell in the home market if you can get within a cent a pound of what it will bring you when shipped on commission. For the benefit of some, it may be well to mention the exceptional cases that sometimes occur when there is a failure of the crop in your own locality. Suppose your home market requires 5000 lbs., and you have secured only 2000 lbs., and no other is to be had nearer than the city market. Looking at the market reports you find it quoted at 14 cts. Deducting freight and commission you find you will have less than 13 cts. left; and considering all risks as to breakage, etc., you will do well to count that a cent less; or 12 cts. in your home market will be as well as or better than to ship to the city. So you sell your 2000 lbs. at home for \$240. The merchants of your town must send to the city for an additional 3000 lbs., and freight and risk is such that it costs them, besides the 14 cts. paid in the city, an additional cent or more. Indeed, they would rather pay 15 cts. cash delivered at the store than to send to the city. Is there any justice in paying 15 cts. for the 3000 lbs., and giving you only 12 for the 2000? I don't see any reason why you should not have the 15 cts., and thus put \$60.00 more in your pocket. So when the crop is such that your home market must be partly supplied from the city market, you should get in your home market at least the full amount of the price quoted in the city market.

Marengo, Ill.

REPORT FROM DR. BLANTON.

Friend Root:—The honey season for 1895 was very discouraging. The spring was exceedingly cold and backward, with much rainfall, and the cold "snaps" ran well into the month of June. The month of May was quite dry; June, July, and August excessively rainy. Very little white-clover honey was gathered, and most of the crop was quite dark, and of an inferior quality. My sales were from $3\frac{1}{2}$ to 5c. I rate the crop in this rich alluvial district at one-third. I commenced the season with 183 colonies, spring count, and extracted 7075 lbs., with a yield of 135 lbs. of wax, and closed the season with 260 colonies. I had a large surplus of comb honey in L. frames, as I did not extract after August 15th. All the weak colonies I supplied with comb honey enough to carry them through the winter. I feel much discouraged, but will "pick my flint and try again," and increase in the spring by dividing to 400 colonies, 200 in each apiary.

From an experience of 25 years I obtain the best results from a big hive—ten Langstroth frames in the lower story and eleven in the upper.

I have acquired almost as good results from 20-frame one-story L. hives, but they are more

expensive, requiring twice the quantity of sheeting and top, besides covering so much ground. They are so easy to manipulate that a bee-keeper of little experience has not the judgment to leave a sufficient amount of honey for the brood.

O. M. BLANTON.

Greenville, Miss., Dec. 1.



WINTERING BEES IN HIVES PARTLY FILLED WITH COMBS.

Question.—Please give me a little information in GLEANINGS in regard to my bees. I have them in a cellar under a part of the house where the temperature can be kept at from 40 to 45 degrees. A part of the colonies filled only one-half of the hive with comb, the other half being empty. What ought I to do with these to have them winter to the best advantage?

Answer.—Much depends upon the shape of the empty space. If it should so happen that the bees are in frame hives, and that half of the frames were filled with comb and the other half empty, the proper course would be to take out the empty frames and insert a division-board close up to the frames left. But if, as would most likely be the case where the bees were left to themselves, the comb was in box hives, or was built in all of the frames about half way down, the middle frames containing more and the outside less, then it would be as well to leave them as they are, for they could not be helped much by any contraction of the hive which could be done. Bees winter best with a vacant space under the combs, and for this reason they would winter well as they are, providing all other conditions were favorable. However, I should advise that, in the future, the bees have only the number of frames, or amount of hive space they can fill, given them when they are hived, if you have not already looked after this; for then, in the case of frame hives (and you should use no other), it would be easy to fill out the hive with frames from other hives, or contract with a division-board as best suited to your wants.

FEEDING BEES WHEN IN WINTER QUARTERS.

Question.—I hardly think that the bees spoken of above have honey enough to last them until spring. How can I feed them? I shall have to feed them sugar syrup, as I have no honey of any kind on hand.

Answer.—In the first place, this matter should have been looked after last fall, during the month of October, or earlier, if you do not have flowers which are likely to yield honey during the month of September, for the winter is a very poor time to feed bees. But as this was not looked after when it should have been,

we must meet the conditions as we find them. Therefore I should arrange the hives so I could inspect them every week without disturbing them after the arranging, except to lift the covering over them, which can be done so gently that the bees will not notice it. To inspect them, take a sperm or wax candle with you into the cellar, as this is far better than a lamp for this purpose, as you can throw the light just where you want it without the heat affecting the bee, or running the oil out of your lamp, both generally being done where a lamp is used. Having the candle held near the top of the hive, carefully raise the covering, which should be of cloth (put on in arranging, if you did not already have this cloth on); and as soon as raised, run the eye over the tops of the combs; and as long as any sealed honey is seen near the bees, no feeding is necessary, and the bees should not be further disturbed. If no such honey is seen, then the bees must be fed. If it should so happen that there is plenty of sealed honey on one side of the hive, while the cluster of bees is on the other, the combs should be changed so the honey will be near the bees, fixing something over the tops of the frames, but under the covering, so that the bees can easily move over the tops of the frames on to this honey, else they may starve by failing to cross over or around to the honey. If it becomes necessary to feed, remove one or two of the empty combs from the side of the hive farthest from the bees, so as to disturb the bees as little as possible, and also not to have live bees on the combs when the combs are taken to the shop or house and filled with syrup. This syrup should be of about the consistency of honey, and about blood warm, so as to go into the cells easily. To get it into the cells, pour in a fine stream from a dipper, or some utensil having a spout, which should be held a foot or more above the combs so that the falling liquid will force the air out of the cells, thus filling them. If this is not done, the syrup will simply run over the tops of the cells, not filling them at all. To prevent spattering and daubing things, it is best to lay the comb flat down in some rather deep vessel so that the sides will catch all that flies off, preventing all waste also, so that what is caught in this vessel can be used for filling other combs. After filling as many combs as you wish, spread the frames of comb in the hive till you divide the cluster apart, somewhat, on one side, going slowly so that no bees need drop down out of the hive, and place the combs of syrup in the empty space thus made, when all should be brought up to bee-space apart again. Enough should be set in to last until spring, so as not to be often disturbing the bees. If you set the candle a little way from the bees, and work carefully, being especially careful not to breathe upon them, you will have no trouble

from their flying or leaving their combs so but that they will run back on to them again. If the bees are in box hives, all you can do is to guess at their condition; and if you guess they are short of stores, then turn the hives bottom side up, and pour some of the blood-warm syrup on the combs and bees. But if I had bees thus in box hives I would as soon risk them as to their starving as to risk their dying from the disturbance necessary to this way of feeding. The days of box hives are past; and if our questioner has bees in such hives, I trust that they will not thus be after next June.



NEW subscriptions, as well as renewals, are fairly pouring in upon us now. Thanks.

Do not fail to read the very important article by Prof. Cook, in this issue, on how bee keepers may prevent low prices on honey, and paying exorbitant freight rates.

I EXPECT to be present at the Chicago convention, Jan. 9, 10. The place of meeting is to be the New Briggs Hotel, Chicago. I shall be glad to meet any of the friends whom I have disappointed at other conventions which I could not attend, owing to ill health. Tickets will be sold on the certificate plan, 1 $\frac{1}{4}$ fare, round trip. Purchase tickets of your local agent and call for a certificate.

"A NUMBER of complaints have been received at this office recently against C. R. Horrie & Co., a commission firm at 224 South Water St., Chicago," says the editor of the *American Bee Journal*. Complaints have also come in to us, and, for the present at least, we must caution bee-keepers against sending them honey. Some time ago they sent us their advertisement; but we refused to insert it because their commercial rating was hardly satisfactory. It seems some of the journals did accept their "ad," and one publisher furnished them his list of bee-keepers' names. At all events, they received a large number of consignments, and by reports, it appears, that some bee-keepers at least, are getting any thing but satisfactory returns.

I STATED, in our last issue, and, as I thought, at the request of the publisher, that the *Bee-keepers' Quarterly* had been discontinued; but Mr. Heddon, it seems, changed his mind after he wrote us to that effect. At all events, our first intimation of the matter was a postal reading thus: "Please make no mention of the suspension of the *Quarterly* until you hear from me again." Well, a day or two after,

along came a letter from Mr. Heddon, stating that his paper was discontinued, and giving his reasons in full. Naturally enough I supposed this was the letter that was to come. I did not notice at the time that both postal and letter bore the same date. It seems, then, that the postal which Mr. H. intended should countermand the letter got here first through some bungling in the mails. Notice that the postal does not say that Mr. H. had changed his mind, or that the paper was *not* to be discontinued, but simply left me to infer that a letter was to come giving particulars, and this letter asked me to make the notice which I did. While I can't see that I was at fault, I regret the mistake. As I understand it, Mr. Heddon's health has improved so that the *Quarterly* will be continued as usual.

HONEY-BOARDS OR NON-BURR-COMB TOP-BARS.

In the *American Bee Journal*, Query 999, this question is asked: "To prevent burr-combs, is any thing as good as the Heddon slatted honey-board? If so, what?" Of the 24 who answer, 4 give it as their opinion that there is nothing as good; 17 think there is something just as good, and better. Of this number some lay stress upon exact bee-space, and generally $\frac{1}{4}$ inch, and not over that, and others on thick and wide top-bars in connection with exact bee-spaces. Only three of the entire number—that is, out of the 24—express themselves as not being competent to speak on the subject.

When this question was propounded a few years ago in the same journal, and in the same department, a great majority expressed themselves as being in favor of the slatted honey-board. The tables now seem to be pretty nearly turned in favor of top-bars and bee-spaces as against the slatted boards; but I notice that none of the respondents strike upon this point—that the honey-board does away with *only one* set of burr-combs between the slatted board and the super. Between it and the brood-frames below, if the old-fashioned spacing is used, and narrow top-bars, there is the usual set of burr-combs. By the use of thicker and wider top-bars, and a bee-space of $\frac{1}{4}$ inch, we do away with practically *all* the burr-combs. It seems to me there is no comparison between one system and the other. The slatted honey-board only *half* does the work, and the other system does it *all*, or practically so.

RAMBLER ARTICLES AGAIN.

In our last issue I stated that the Rambler articles were to be discontinued with that number, unless there was a substantial request from our subscribers to the contrary. Later, since that time, postals have been pouring in at a good rate, saying something like this: "Keep up those Rambler articles; or, at least, give us

some substitute, from J. H. Martin (Rambler). We enjoy his writings and want them continued."

Mr. Martin, for various reasons, has decided to settle down "in some lovely spot in California," and keep bees for all there is in them. He has traveled thousands of miles for GLEANINGS, and now desires a rest. I am happy to state, however, that he is "hatching up a new scheme" that I think will prove, perhaps, as interesting, if not more so, as his Rambles of old. I have no doubt, too, that, after the busy season, his old yearnings for outings will come back, and another rambling-tour will be taken. The result of which will be given to the readers of GLEANINGS in his usual style. I said he was hatching up a new scheme. GLEANINGS never makes a business of telling very much beforehand what it proposes to do, except in cases where our plans are so fully matured as to be practically under way. So I'll not say more at this time.

THAT "EVERLASTING FOOTNOTE."

OUR answers to articles have sometimes been referred to as above in a connection that implies that they are written for the express purpose of counteracting what was said in the article just preceding. If our readers will take careful notice, they will see that it is seldom that I take occasion to disagree with or criticise the statements of a writer; and I do it then only to correct what, in our judgment, I consider to be an error, or, at least, something if unchallenged that would lead only to expensive mistakes. Sometimes a writer proposes a plan that some of us have tried to our sorrow; and, obviously, it is to the betterment of apiculture that the result of that test be made public. The *main* object of the footnote in our columns is to enlarge upon something that is already stated, or to emphasize that which needs more prominence than is given in the article.

Several times in years past we have asked our readers if they would prefer to have the footnote omitted. But a flood of postals always poured in, saying, "No, no, Bro. Root! keep them going right along." Some say they read them first, and then the article. Others have said the articles would not be of much value to them unless they received the editorial indorsement. Out of hundreds of cards in the past, giving various sorts of expressions, I think we have received scarcely one requesting their discontinuance.

Now please don't let any one get the impression that when the footnote is omitted from any article that this article does not receive our indorsement. On the contrary, it is complete in itself, and nothing that I can say will emphasize or add to it.

THE HONEY BUSINESS IN GOVERNMENT BULLETINS.

In the last Report of the Secretary of Agri-

culture, bearing date 1895, under the head of "Subsidiary Farm Products," a little "information" is offered in regard to honey. The person who wrote up the subject was not, evidently, very well versed in apicultural phraseology. For instance, he uses such sentences as these: "All honeys sent to England are *strained*, except a nominal amount that reaches there in the comb from California." And again: "The Department has knowledge that, some years ago, a large honey-maker in California found in China a profitable market for some 20 tons of honey annually." Again, "In this, as in every other branch of industry, only the *makes* of the best, most genuine products, can secure a permanent, profitable trade." The italics in the above are mine. No reputable bee-keeper "makes" honey, but he does "produce" it. It is evident that the writer did not intend to throw discredit on the industry; but such phraseology would rather imply that his knowledge of the business was comparatively limited—too limited, in fact, to be able to write intelligently for a government bulletin. His statements as to facts, also, are more or less wide of the mark.

It is to be regretted that there is so much of this kind of work from the hands of our government officials, especially as all needed information in regard to honey, or any thing else, can be so easily procured from sources which are unquestionably authentic. It is too often the case that the government agent gets his position through "political pull," when he is utterly incompetent. I am pleased to note, however, that the President has recently put more officers under the civil-service rules. Every official should be obliged to pass a rigid examination; and, when a competent man is found he should be kept, independently of party changes.

Some one has recently asked if we could not have a distinctly apicultural bulletin, issued by the general government. Well, here we have it, and it is in marked contrast to some of those of which I have just been speaking.

A 120-PAGE BEE-BOOK FOR FREE DISTRIBUTION.

I HAVE been aware for some time that Mr. Frank Benton, who has been in charge of the apiarian work of the division of the Department of Agriculture, Washington, D. C., was preparing a bulletin on the subject of bees. A few days ago I was surprised, and very agreeably so, to receive the advance proof-sheets of so large a text-book from the Government. Bulletin No. 1, entitled "The Honey-bee: a Manual of Instruction in Apiculture. By Frank Benton." There are in all 120 pages of bee-matter, profusely illustrated. Some of the cuts are drawn from other sources, but the majority of them are original. I have had only time to glance over the work, but have reviewed it carefully enough to say that it is practical and

fully abreast of the times. As Mr. Benton is a scholar and a thorough student the style of the writing, as well as the subject matter, is of the best. I have read a good many of the pages, and so far have not found any one of which I could not say, "This is about as near right as it could be stated." I should like to give you the list of contents, but our space is too limited. The following are subjects of the chapters as they occur through the book:

1. Classification of the Honey-bee; 2. Kinds of Bees composing a Colony; 3. Quieting and manipulating Bees; 4. Establishing an Out-apiary; 5. Hives and Implements; 6. Bee-pasturage; 7. Spring Manipulation; 8. Securing surplus Honey and Wax; 9. Rearing and introducing Queens; 10. Increase of Colonies; 11. Wintering Bees; 12. Diseases and Enemies of Bees.

It is needless to say that no one is more competent to write on the subjects given in chapters 1, 6, and 9, than Mr. Benton. The first, doubtless, gives us the most accurate information on the subject of the different varieties of bees of any thing there is in print; for Mr. Benton has traveled over the world in search of new races. Chapter 6, bee-pasturage, is very full, and the illustrations are fine.

Five thousand copies of this work will be "ready for distribution by the Department of Agriculture in a few days. It is, like all other bulletins of the department, for gratuitous distribution to applicants in the order in which the requests are received."

WORK AT THE MICHIGAN EXPERIMENT APIARY;
FOUNDATION, AND WHICH GIVES
MOST HONEY TO THE CASE.

In the *Bee-keepers' Review* for November, Mr. R. L. Taylor tells of a second series of experiments in testing the relative values of the different foundations—that is, the different makes. The experiments of last year seemed to show, if I remember correctly, that the Given had a little the lead; that is, the bees built out the Given more rapidly, and filled it plumper with honey than the other sorts of foundation alternated with it.

This year Mr. Taylor took a series of cases, each of a capacity of 24 lbs.—as many cases as there were samples of foundation to be tested. "To make the test a fair one, each case was filled with one of the sorts of foundation selected for the trial, and the other half with another sort, the two sorts being made to alternate throughout." For instance: One case contained 12 sections filled with Dadant foundation, and 12 sections with the Given. Each row of foundation alternated, as I understand it, with another row of the other kind. Another case was prepared in a similar way with Root foundation and Given, and so on through the list. It will be noticed from this that the Given was used as a standard of comparison in each case; and this particular Given was made from wax of a "hard brittle character"—the object of selecting the hard wax be-

ing, I suppose, to get a foundation which would yield results rather under the others to be compared.

The foundations tested were obtained in such a way that the makers would not be prepared to send something special. The different sorts tested were the Dadant, Root, Hunt, Given (made of hard wax), the Root-Given (Given foundation with heavy side-walls, made on Root rolls), and old Given, that which had been used in the tests of last year.

Well, after all the cases above mentioned containing Root, Root-Given, Hunt, and old Given, were drawn out and filled with honey, the cases were weighed, and the relative amounts to the credit of each foundation are set forth in a table. With one single exception there was less honey built from the Given foundation than from any of the other sorts—the reason for this being, I suppose, because the wax in the first place was harder. There was 8 per cent more honey built from the Roots than from the Given; $3\frac{5}{10}$ per cent more from the Root-Given than from the Given; 15 per cent more from the Hunt than from the Given; and 23 per cent more from the *old* Given than from the Given.

Another interesting fact is, that the Given foundation made on rolls, or, rather, that foundation having heavy side walls, and a perfect fac-simile of the side walls of the wax made from the Given press, compares very favorably with that made upon the press. In the cases containing the rolled Given and the Given, the half super of the former weighed 12 lbs. 6 oz., and the latter 11 lbs. 15 oz. But here, perhaps, Mr. Taylor may differ with me in stating that the *old* Given gave 23 per cent of excess over the Given made on a press; but this case of honey may have been on a better colony than the *old* Given.

Taking it all in all, I am strongly of the opinion that the foregoing tests do not prove the superiority of the *method* of embossing the wax after it is sheeted, so much as it proves the superiority of the more pliable wax over that less so *before it is embossed*. The nearer we can get to having the wax soft in the first place, the quicker will the honey be filled out, and the fatter the sections.

For instance, in the Root and Given super the two sorts of wax contained exactly the same number of feet to the pound (10.92); but the Root gave 11 lbs. 9 oz., and the Given, made, as you will remember, from selected hard wax, 10 lbs. 11 oz. per half-case.

I expect great things from the new process of sheeting wax under the Weed patent. The old method of dipping to procure sheets, compared with the Weed method, gave us products that are as cast iron to wrought. The wax by the old method is brittle, while that by the new method is soft and pliable.

DOCTORING WITHOUT MEDICINE; MORE ABOUT ZWIEBACK.

From the inquiries received, I feel sure many of the friends will be interested in this wonderful new health-food for invalids. One comforting thing about it is, it is not only cheaper than medicine and doctors, but is cheaper, at the present low price of wheat, than almost anything else one can live upon. Get the very best quality of wheat you can find. If you think the wheat from Minnesota is superior to that in your own locality, get some Minnesota wheat. Have it cleaned in the most approved manner. Remove not only all foreign seeds, but all shrunken or broken grains. An expert miller can do it for you, or perhaps add the finishing touch to the cleaning. I do not know how many mills for making whole-wheat flour there are in the country. The apparatus is very simple. I have visited the one within four or five miles of us, and I have asked our miller to tell me something about it. Here is his letter:

Mr. A. I. Root:—The wheat is first thoroughly cleaned and scoured, and then ground on a buhr mill with a very smooth face, then bolted on a centrifugal reel manufactured by myself. It is clothed with silk cloth. The process is very slow, as it is necessary to get all the gluten off the bran; and by grinding too fast you are unable to do this. The gluten is the most essential part of the whole-wheat flour. The buhr mill I am using is a 20-inch mill manufactured by Nurdyke & Marmon Manufacturing Co., Indianapolis, Ind.

If there is anything more you wish to know I should be glad to give you any information I can. Abbeyville, O., Nov. 29. W. B. McKENNEY.

In regard to the price of the mill, he has since written as follows:

I am unable to give prices on machinery for manufacturing whole-wheat flour, but I should think \$300 would purchase all the machinery necessary. Abbeyville, O., Dec. 3. W. B. McKENNEY.

Several have informed me that they have made excellent whole-wheat flour by grinding it fine in one of the large-sized coffee-mills, or even in the Wilson bone-mills which we offer for sale. That produced by the writer of the above letters is mostly sold in 10-lb. sacks. A 10-pound sack costs us 25 cts. It is retailed by the grocers generally at 30 cts. I believe it is considered better to buy a little at a time, and often. Ordinary fine wheat flour can be kept several months, or a year; and, in fact, a good many people buy their year's supply at one time; and the good housewife, when she gets acquainted with a certain brand of flour, knows just what to calculate upon for a whole year. Well, for some reason I can not explain, the whole-wheat flour does not keep like the other. Friend McKenney advises all his patrons to make bread from the whole-wheat flour exactly as you would make nice white bread. I have interviewed Mrs. Root, and, as nearly as I can make out, the process is about as follows:

In two quarts of water and milk* (half and

*The milk should be omitted in treating people who are very sick; in fact, I have tried to have Mrs. Root omit the milk. She says she can not make real good bread without it, and all the rest of the family very much prefer it, and so I have used it in that way. I have written to Dr. Lewis in regard to the matter, and here is his reply:

Dear Mr. Root:—Bread made of whole-wheat flour is more easily digested without the milk or cream; and for dyspeptics it is much better. The milk and cream make it sweeter, and for some persons more palatable. In our own management of all organic troubles, breadstuffs of all sorts are prohibited until they can be taken without injury to the patient. When allowed it should be under the watchful care of a physician trained along the line of treatment we advocate and practice. Glad to know

half) she dissolves four cakes of compressed yeast. If you do not use such yeast, vary the directions I have given, accordingly. Now sift in your whole-wheat flour until the dough is sufficiently stiff to be kneaded. Knead well, and put it in a bread-pan. Set it away where the temperature will be just right for it to rise. We have a shelf just over the reservoir of our Stewart stove, near the pipe, where the temperature is always just about right. When it is ready, which will be in about three hours or less, it is made into loaves, and they are baked in what we call the World's Fair baking-tin. We call it "World's Fair" because she learned the process during our visit to the World's Fair. It was given in a talk by Mrs. Ewing, a celebrated teacher on bread-making. These bread-tins I am speaking of are about like a section of small stovepipe split in two lengthwise—a shallow trough without ends. The advantage is, that the bread bakes much better than where the bottom of the tin is flat. She has made such delicious and toothsome bread ever since that visit to the World's Fair that we as a family have become large bread-consumers. If you have not tried any of the World's Fair bread I think you had better have some, for we pronounce it by all odds the best bread in the world. The recipe given above calls for an extra quantity of yeast, and this costs something, I know; but if you can get a family to eating bread largely, instead of the crackers bought at the grocery, or pie and cake, you will save in health and in doctors' bills ever so much more than the cost of a few more yeast cakes at 2 cts. each. In my directions for zwieback, I said I have baked the slices of bread several hours. Mrs. Root tells me the zwieback is better, and more crisp, to be baked as quickly as you can without having it brown on the outside before the middle is perfectly dry. In fact, some of the nicest I ever ate was made and all finished the same day the bread was baked.

Now, for a good while, even while our family was using zwieback to a large extent, I refused to touch it. I said they might eat "dry crusts" if they wanted to, but I hadn't time for so much foolishness. Since I have been under the doctor's care, however, I have become so fond of it that I never know when to stop eating. In fact, I think I could eat zwieback for two hours, and still enjoy it. Sometimes when hurried I have put a piece in my pocket, and have eaten it leisurely at my work. Or if the women-folks get in a hurry, and want to clear off the table, I sometimes sit down at my desk, with my agricultural papers, and eat zwieback while I read. After it has been chewed up fine I still chew until it is a delicious creamy mixture, made by combining with the liquids of the mouth, produced by nature for this very purpose. Now, if you stop chewing for a little while, because you have got your mind on something else, you will all at once wake up to the fact that you hold in your mouth the most delicious food you ever tasted. In fact, I have often thought, especially of late, that there is nothing in the way of fruits, nuts, fish, or game, that could be compared with it as an article of food; and the very best thing about it is that it never leaves any unpleasant taste after you stop eating—no, not even if you eat zwieback for an hour. The same is true with the lean-meat or beefsteak diet; but, in my experience, with a very few other articles of food. For years I have been so accustomed to having a sort of sour or bitter taste in my mouth for

you are feeling better. Do not digress too frequently or too radically.

Cleveland, O., Nov. 25.

J. M. Lewis.

some little time after eating almost any thing, that I got to expect it as a matter of course. With the lean meat or zwieback I have never noticed this once; but if I eat fruit or sweets of any sort, the same old result is sure to follow. Very nice zwieback can be made of *white* bread, or even of *baker's* bread, but it has not the rich nutty flavor that we find in that made from whole-wheat flour. Well might bread be truthfully termed the "staff of life," if the bread is made of whole-wheat flour, and then afterward baked, or twice baked, as I have described. I believe invalids almost all agree in regard to this. Let me say once more, that it is ever so much cheaper than crackers, and ever so much more wholesome. I do with zwieback of some kind might more largely take the place of crackers. When I went to Atlanta I carried along such a quantity that I brought some back. It was put aside, and by some oversight it did not get on the table until two or three weeks after it was made, besides taking that long journey in my lunch-basket. But after all this, the whole family pronounced it just as good as the freshest made. I believe, however, Mrs. Root gave it a third baking in the oven, to purify it and dry it out. If I am correct, Drs. Lewis and Salisbury place zwieback next to lean beef, and I am sure they are right. Vegetarians and meat-eaters can all unite and agree on zwieback, even if they do not on the rest.

Now, when one has got so that he can eat other kinds of food, what shall he take next? Well, I presume each person must experiment and study into the matter for himself. I found the gluten preparation or graham crackers, granose, wheat-germ grits, and Pettijohn's breakfast-food, to come next to the zwieback. In the way of fruit I was pretty strongly inclined to baked apples, or nice apple-sauce made without sugar, first. Dr. Lewis, however, places California prunes, cooked without sugar, ahead of any other fruit; and after considerable careful experimenting I have decided his head is level in this matter also. I wonder if our friends out in California, who raise prunes by the tons and carloads, are aware of this fact. Why don't they make a bigger stir about it?

When the digestion is still weak, the prunes should be first boiled, and the water or juice poured off. In some cases it may be better to do this a second time. Now cook them once more, carefully peel off the skins, and eat the pulp with your zwieback (of course, you will not swallow the stone); and if you commence eating, say one at breakfast, and no more during the day, and keep this up until your digestive apparatus has learned how to manage the one prune, then you may take one at breakfast and one at dinner; and in a little more time you may take two at breakfast and two at dinner, and finally three; and later still as many as you really care for, just as you eat your meat and zwieback. If, however, you should commence by eating a whole saucerful just because they taste so delicious, you would have a backset, and possibly imagine that all the pains you had taken with your diet had not really amounted to any thing—you were the same old sixpence. Your digestion must get acquainted with things just exactly as *people* must get acquainted with each other. When any delicacy in the way of fruit or vegetables first comes on to the table at the proper season, take a *little* at first. One reason why so many people say honey makes them sick is because they go and eat a great lot when they have not tasted any honey before for perhaps weeks or even months. No wonder it did not "agree" with them.

Now I have something more to tell in regard to doctoring without medicine. My venerable friend VanDusen was inclined to poke fun at me at Atlanta because I had two kinds of medicine to take, even in a public restaurant, before I commenced on my meat and zwieback. At present I am not taking a particle of medicine, and have not been for some little time. Now, this is not the best part of it. The best is this: I was really surprised to find a few days ago that I had reached a point when I not only did not *need* the medicine, but was better off without it. My digestive apparatus seemed to say, "Look here, Bro. Root; this outside assistance is not needed at all now. In fact, it is beginning to stir up unpleasantness." I took the hint, and used a smaller dose. Finally Nature said, "We do not want the *smaller* dose. There is now no need of any 'physic' or any thing of the sort. You just leave your medicine on the sideboard, and attend to your other affairs, and we will run your daily habits as regularly as a clock." And Nature is doing it right straight along. It is a mystery to me, and I can hardly understand it. I can eat as much beefsteak at a meal as is used by a good sized family ordinarily—yes, more too; and I can do it three times a day, and not a bit of constipation. I am now eating just what I please, if you will accept this last with some modification. I am not using any sugar, however, *at all*. I do not *want* it. I have prunes whenever I want them, and as many as I want. I can almost say the same of baked apples. I should like potatoes in a little larger quantity than Nature approves of; but this is a comparatively small trifle.

Before I go further, perhaps I should say I tried leaving off medicine several times during the first three or four months of my beef diet, but it did not answer. Again and again I was forced to conclude that the *doctor* knew best. I have always been afraid of becoming a slave to quinine, physic, pepsin, or something of that sort. You might in one sense say I am a slave to lean meat even yet; but I think no more, or but little more so, than to hot water. I rarely drink *any thing* at my meals, but I do have big drinks of hot water in the middle of the forenoon and middle of the afternoon, and this I must have. One need not worry, however, when he feels that he has become so much addicted to *pure water* that he can not very well get along without it. May God be praised; and may he help others out of their troubles as he has helped your old friend A. I. R.



ATLANTA.

By some misunderstanding, the first session of the bee-keepers' congress was to meet in Council Hall, on the exposition grounds. It was announced through the bee journals to be at the Hotel Jackson. This threw things out of shape, so that the first day was spent mainly on the exposition grounds.

The 4th of December, you will remember, was not only about the coldest day during the whole of that month, but it was one of the coldest days ever known in Atlanta in any month or any winter. On leaving home I took the precaution to be well bundled up; and, fearing I should get chilled, I chose to go over to the grounds by steam-cars instead of by the electric line. Somebody said they were rather warmer.

First we had to wait for the cars to start. There was no warm depot to wait in as we have here at the North, and the cars themselves were simply open summer conveyances. Of course, there were some very loose light curtains flapping in the winds; but these only served to make one more chilly. By the time I reached the exposition I was chilled through and through. Somebody said Machinery Hall would be the warmest place early in the morning; but the weather was unexpected to most of the people, and a good deal of the machinery seemed to be frozen up. One might get up near the great engines, and warm up one side while the other got chilled. Perhaps I had better call a halt right here or I shall be complaining before I know it. People with much vitality, and strong, robust constitutions, where they were exceedingly well clothed, perhaps did not mind the weather very much; although I am inclined to think that many others suffered as well as myself; for wherever there was a warm place, even if it were only a big campfire in the open air, I saw rich and poor, little and big, white and colored, huddling up close together to get warm, forgetting all imaginary lines of caste and social standing. Since getting home I am told that some of the friends from Florida caught severe colds, just as I—*came pretty near doing.*

There was enough in Machinery Hall alone for one to study a whole day, and so with dozens of other buildings. One of the first things that attracted my attention was a new device for raising water. The way you get the water out of the well is to pump air down to the bottom; and by an ingenious contrivance the compressed air is made to go under the water, and shoot it out of the top of the well, bringing sand, gravel, dirt, and every thing else up. There were several things accomplished by this device. First your windmill, engine, or other power that works the air-pump, may be at any convenient distance from the well, for you can send air through iron pipes laid right on top of the ground, without any danger of freezing. There are no valves to clog and stick up and wear out. The water pours forth in a steady, constant stream, so long as the air is forced down into the well.

Pretty nearly all the varieties of automatic machinery we saw at the World's Fair were at Atlanta; and some things of later date than the World's Fair times. An automatic machine turned out corkscrews by the bushel, ton, or carload. All it wanted was wire, and power to move it. Speaking of automatic devices reminds me that I have always been greatly interested in devices whereby machinery might do the work of buying and selling. Hold on! I do not believe I ever saw a machine that would make purchases, and drive sharp bargains; but we do now have quite a good many machines for *selling* various commodities. At the World's Fair, you know an automatic machine sold Waukesha drinking-water for a penny a glass. Well, at Atlanta, stationed all over the grounds, we saw solemn-looking machines proclaiming to passers-by, "Ice-cold orange cider for a nickel a glass."

The "ice-cold" was rather a burlesque on that particular day. If the machine had said hot coffee or hot water, the former would have struck the crowd more favorably, and the latter would have hit me exactly. Other beverages than orange cider were also served by automatic machinery. I do not know how much they were patronized, or how well the apparatus did its work; but it seems to me as though there might be a great future in developing this matter of having machines to receive

money and deliver goods of certain staple kinds. The machines themselves certainly would not be guilty of running off with the money, cheating in change, nor giving scrimp or scant measure; at least, if it scrimped to one individual it would scrimp to all, so there would be no partiality or favoritism. Perhaps I might mention here that hot tea and coffee were sold all over the grounds for a nickel—that is, where the apparatus was not frozen up.

Friend Danzenbaker had a stand in Agricultural Building, where he explained the wonderful advantages of his hive. I asked one of the bee-friends if he kept there right along; and when he nodded assent I said, "Why, how does he keep warm in a building that has no arrangements for heating?"

The reply was, "He keeps warm by talking, of course."

Lest I be accused of sarcasm I want to say right here that friend Danzenbaker is certainly a well-posted bee-keeper. His ideas—at least most of them—are sound, and he is doubtless doing a vast amount of good by explaining things to crowds, and directing bee-keepers into better and more improved channels of work.

Somebody suggested that Electricity Building would be warm, and so we started over there. On the way one of the crowd said: "O Mr. Root! you must take just one glimpse of this building here, even if you are cold." This was the industrial department for work of the colored people, and it was indeed a surprise. Had no one told you, you might have mistaken it in many respects for an average exposition building. Not only in the products of the soil, but in almost all the industrial arts, there were samples of work that would compare favorably with almost any thing we have; and, best of all, there were samples of their school work—writing, drawing, composition. Kindergarten work, and every thing else to show what the colored schools of the South were accomplishing. Best of all, there were excellent photographs, taken, of course, by colored artists, of the educated and intelligent colored men and women. My eye caught a glimpse of Booker Washington, and then quite an array of excellent pictures of ministers, lawyers, and doctors, among the colored people. Well has it been said that the crop of boys and girls are the most important crop that any farmer ever undertook to grow. But it takes more than one summer—yes, or a decade of summers—to grow a crop of educated men and women. The idea burst upon my intelligence with wonderful power, that the first, or almost the first, crop—matured crop—of colored people, the work of educating the freemen of the South, was just now coming before the world.

A colored lady stood near the entrance, to welcome visitors. Notwithstanding her features showed almost pure African blood, there was an air of gentility, self-possession, and refinement that nothing but education can give; and when some vulgar and uncourteous white people who were passing by looked her in the face with a bold stare, and said, with a coarse, unfeeling laugh, "Well, that is pretty good for niggers, any way," our colored friend had not only education enough, but grace from the Lord Jesus Christ, to reply with gentleness, and even with a pleasant smile, to those rude sallies. Education and Christianity can not, it is true, make a dark skin white; but they can change the coarse low mind into one of gentleness, purity, and truth. I do not know just how to solve this problem of the colored people and the whites living side by side; but I do know that the spirit of intelligence and meek Christianity should be recognized and *respected*,

no matter whether its possessor be white or black.

Just then I was admonished that, if I did not get into some warm building, I should be chilled to such an extent that there would hardly be a vestige of the work left of what the beefsteak diet has been doing in the last few months. We went into Electricity Building; but while it glittered like the northern lights, with shining metal and scintillating dynamos, it also seemed to me like the *chill* of the northern lights away up to where they are tied up in bundles around the very north pole itself. I cut loose from the crowd, and told them I should have to get warmed up, regardless of any thing else. I saw a notice, "Japanese tea, a nickel a cup." A couple of pleasant young ladies were presiding; but the cold was so great they had hardly "thawed out" the tea. I drank one cup, but it was not very warm, and asked for another. This was tendered with some crisp wafer crackers, and all for a nickel. I should have preferred the hot water alone; but I ate the wafers out of courtesy—not because I wanted them. I do not know but they felt sorry for me; and, to tell the truth, I suppose the people were all sorry. They were very kind and courteous, and every thing I asked for was very reasonable indeed.

Somebody told me just about this time that the Florida building was always warm. They had exotic plants there that could not be allowed to get cold, so I spent a great part of my time there, reviewing the familiar scenes of last winter. I have told you about the shell mounds of Florida. Well, the Florida building is one immense shell mound. The very sight of it made my heart throb with pleasant recollections. About half way to the top of the mound there is a sort of jog in the incline, and a band of windows passes clear around on one level. The embankment of earth to elevate the mound keeps out the frost, and a dozen steam-radiators make the building very comfortable. There I saw, in large raised maps, the whole topography of the country I passed over last winter. The shining lakes that are sprinkled almost like snowflakes over almost the whole of the State are represented on the map by pieces of glass. The Florida friends pointed out to us where they lived and the good honey localities; and a thousand other things we have read about, but could not really understand, are very plain as you see them on the raised map.

In the afternoon the weather moderated so I got out with the rest. We had a brief session of the congress in the auditorium; but it was Ohio day, and the Ohio people are a little too demonstrative for any other meeting than their own to be much of a success, in even a *remote* corner of the auditorium.

In blundering around, by some means I found myself in the broad street of Midway. There was the Ferris wheel (or, at least, a smaller one), sure enough. I wanted to take a ride on it; but the way the wind made the people shiver warned me I had better look out. The managers of the fair assured the crowd that it was not cold a bit away up high in the sunshine; but the crowd did not seem to be very well convinced. There were, however, enough tough and hardy ones to keep the boxes pretty well filled. I was looking for some place where it was real warm, without so much regard to the wonderful *sights* or the *expense*. I noticed quite a crowd around one grotesque-looking Turkish building; and a voluble man was urging everybody to "come in and get a glimpse of a real Turkish harem. Come and see the oriental beauties in their native costumes, especially arranged to display their wonderful 'lov-

liness.'" I don't suppose that is *just* what he said, but it comes near enough. I instantly grasped at the probability that these women would have to be kept warm, and here I should find a warmer apartment. Some gentle-faced women were urging their husbands not to go to see the wicked institution; and before I knew it I was pushed along in a crowd of—well, it seemed to me as if they might call them wicked *husbands*. Just as I was passing in, something seemed to say, "Look here, old fellow, how is it going to look if some of your bee-friends or some of your Florida acquaintances should say that they actually saw *A. I. R.* paying out his money to go in with a crowd of roughs to see a public display of the interior of a Turkish *harem*?" By that time, however, I had got inside. Well, the room was not warm at all; in fact, I rather think it was the frozen ground, just like that outside. The only women to be seen were photographs of statuary, and I should think the statuary was *very* cold at the time the photographs were taken. You look through a series of big magnifying-glasses to see them. A fellow near me, who had invested his money contrary to his wife's advice, looked through one of the lenses, uttered a vehement "Gosh! swindled again!" and pushed for the exit, without even deigning to notice the twenty or thirty other places to be looked into. I, however, took my time and went the rounds, and thought I would see how much there was so very bad, even in Midway. There was not any thing worse than you see in exhibitions of marble statuary in almost any of the fine-art buildings. The proprietors of Midway made capital by pretending they had something that was really wicked, when they hadn't. In other words, they made everybody believe they were going to see live women instead of just pictures of women in marble; and I don't know but this part of Midway is teaching mankind some wholesome lessons after all.

Yes, there was a veritable bull-fight advertised as going on all the time the very day I was there. It cost 50 cts. to see it; but if you looked carefully there was one line of fine print that said there would be absolutely no bloodshed, neither would anybody's life be endangered, even if the bulls *were* the wildest and fiercest that could be captured from the wild herds of the plains.

My teeth were chattering by this time, and I mixed in with a motley crowd that was trying to squeeze in around a bonfire made of pine boxes. When they got in, however, the fire was so hot they were in as much of a hurry to squeeze out again.

As it was getting toward night, I decided to go home on the electric cars that time, hoping they would be quicker if not warmer than the steam-cars. We had the same flapping curtains that might be beautiful during a warm day, but they did not fill the bill just that afternoon—at least to me. I longed for the radiator in my room at the hotel. When I stepped from the car it was night. I asked somebody to show me the shortest cut to Hotel Jackson. Three or four persons stopped and took pains to give me the fullest directions; and, by the way, I found this cheerful, ready spirit all through Atlanta. Everybody, almost everywhere, was ready to stop and look after a stranger, and show him all the courtesy he could ask for. When I was down in Mississippi I told you of a queer expression one hears. When some one points out a direction you are to take, instead of saying, "Go that way," as we do here in the North, he says, "Go that a way." In fact, the word "way" is so generally preceded by that queer little vowel *a*, that I

think I could almost tell a Southerner by simply asking him what direction I was to take.

Judging from past experience, and especially the way my throat was buzzing and humming, I expected to pass a sleepless night, and be down sick the next day. I stepped into a corner drugstore and told the clerk my predicament. He reached into a drawer, and gave me some throat lozenges without any sugar in their composition. I told him that I did not want any thing with sugar in it.

"Now," said he, "you can fix that throat of yours so you will sleep all night, by a counter-irritant. Bring that pain and soreness to the outside. That old remedy, Perry Davis' pain-killer, will do it as well as any thing you can get. Take a good dose of it when you go to bed, according to directions, then rub it on your neck and throat and chest until it begins to take hold of the flesh and make it burn. This will relieve your throat. Take one of your big drinks of hot water before you go to bed; cover up warm; and in the morning, if you are all right, score one for Perry Davis."

The above is my version of what he said, and it succeeded so well I think I shall have to score one" right here for a chapter on doctoring *with* medicine. By the way, these counter-irritants are often of much value, and their action is as straight and sound sense, almost, as a surgical operation. Why, don't you know, boys, when a certain hive of bees is robbing some other one, if you disturb their hive and break down their honey you turn the current of mischief in a harmless direction? Give the robbers all they can attend to somewhere else. Well, this throat of mine seems to be the weak point in my system. A cold always takes hold and centers there first; and it was really only a very simple thing to drive it off with an external irritant instead of one that is internal. The former I did not mind; the latter prevents me from talking; and when you keep me from talking, you have pretty nearly boxed me up. I attended the convention all next day; and by keeping in a warm room I was pretty nearly as well as usual, and did my full share of talking. Now, here is another point: The druggist charged me only 20 cts. for that bottle of pain-killer, and I have the most of it yet. Twenty cents for a good-sized bottle is a reasonable and fair price. It gives the manufacturer a big profit, where he puts it up by the wagonload or carload. Yes, 20 cts. not only pays a good profit, but it enables the manufacturer to put in a good corkscrew (one of those made by that automatic machine I told you about, probably), even at that price. One of the bee-friends (I think I will not tell which one) got his digestion out of rig by drinking Atlanta water. He did not have it boiled, and taken hot as I do. He was away from home, and a good deal troubled as to what to do, and asked me to advise him. He said he did not believe in taking brandy; but under the circumstances he did not know but he would have to do it, although he had taken hardly a bit in all his life. What do you think I advised him? Said I, "No, no! do not get any brandy, even if you *know* it will get you out of your present trouble. There are better medicines. Go to the drugstore and get some fluid extract of Jamaica ginger, and take it according to directions." He told me next day his trouble ended soon after the first dose. By the way, pure Jamaica ginger has a wonderful property of restoring a disordered stomach and bowels, many times. There is a kind of fluid extract that is made without any alcoholic liquors, and that is what you want to get. So there are at least two cheap simple medicines that I believe I can conscientiously recommend

—painkiller and the ginger. By the way, I think this painkiller I have mentioned has been a staple medicine for fully fifty years. When I was a child it is almost the first thing I can recollect in the way of medicine that was boomed through all the newspapers until everybody knew the name of it.



SUB-IRRIGATION IN THE GREENHOUSE.

The above is the title of Bulletin 61, from our Ohio Experiment Station. I think I have never read *any* agricultural bulletin with so much interest, and so many times, as I have this one. Perhaps one reason is, the whole is entirely devoted to lettuce-growing, and especially the Grand Rapids lettuce, which it was my privilege to give to the world years ago. One of the pleasantest things to me about these bulletins is the concluding summing-up in the back part; and when I can not go through a whole bulletin on various subjects, I oftentimes turn to the summary and read that. I am now going to give you the summary right here of Bulletin 61; and then if you want the whole you can get it by writing to the Ohio Experiment Station, Wooster, O.

SUMMARY.

1. A water-tight bench-bottom is necessary in sub-irrigation, and may be made of matched lumber, or of any rough lumber, the cracks being battened with lath, after which cement is spread over the bottom to the depth of half an inch. A better plan is to make the bench-bottom of tile, with iron supports. A bed may be made on the ground also.

2. The irrigating-tile may be laid lengthwise or crosswise the beds, and the latter plan has been the more satisfactory. If long runs of tile are used, there should be a slight fall of one or two inches to the hundred feet, and strips of tin should be inserted into the joints at intervals to check the too rapid flow of water to the lower end.

3. Sub-irrigation in the greenhouse grew out of an attempt to prevent lettuce-rot, by watering below so as to avoid wetting the foliage.

4. Watering by sub-irrigation is more efficiently and cheaply done than by the ordinary method; sub-irrigated soil does not harden, but retains its original loose, friable condition, nor does it become mossy and water-logged. Furthermore, plants are less liable to suffer from over-watering and disease by sub than by surface watering, and, in consequence, grow more vigorously.

5. These good effects are supposed to be largely due to the facts that sub-irrigated soil is always in a condition to allow the air to permeate it freely, and that uniformity and constancy of the supply of moisture to the roots are assured by this method of watering.

6. The gain in weight of sub-irrigated lettuce over surface-watered has been, in some cases, as high as 100 per cent; but in most of the experiments about 40 per cent. In one case the increase in the value of the crop was sufficient to pay the cost of the new bench-bottoms, and in all cases the cost of reconstruction has been reimbursed the first season.

7. It is a fact that good head lettuce can not be grown on heavy soil by surface watering, and the same is, in a measure, true of all varieties; but with sub-irrigation this kind of soil is not precluded, hence the method of watering greatly enlarges the possibilities of lettuce culture.

8. Local conditions should not be overlooked, such as soil and market requirements. It would be futile to attempt to follow Eastern methods in this section, because the conditions are different.

9. The head lettuces are grown in the East, but are not demanded in our markets, hence the Grand Rapids is more suitable here, as it can be grown more cheaply.

10. The practice in vogue in the East, of making

beds on the ground, and of using a foot or more of soil, although the best plan there, is not necessarily so where sub-irrigation is practiced, as by this method six inches of soil is sufficient.

11. Lettuce flourishes best in the greenhouse from midwinter until spring, and is usually most in demand during that period; but late in spring it does better in beds out of doors, after which time the houses may be more profitably occupied with tomatoes.

12. The best plan of starting the small plants is in flats, and these are best watered by placing in shallow vats of water, so as to sub-irrigate.

13. The plants should be transplanted as soon as they show the second leaf, placing them 2x2 inches apart for Grand Rapids, and twice that distance for heading sorts; 6x7 inches for the former and 8x8 inches for the latter when planted in beds.

14. The plants should be kept growing from the start, but should not be forced in too high a temperature; 50 to 60 degrees by day and 40 to 50 by night being about right. A high temperature favors the development of lettuce-rot.

15. Ventilation is important or rot will appear. The most critical time is in cloudy, cold weather, because it is then not easy to ventilate.

16. No rule can be given for watering; but when sub-irrigated the soil should appear to be rather dry on top, and wet enough below so that, when pressed in the hand, it will not fall apart when released, but retain the shape given it by the hand.

17. The plants may be sprinkled once when set in the bed; but after that it is not necessary, and is a waste of time; nor is there any need of sprinkling the walks in order to introduce moisture into the air.

When the bed is full of thrifty-growing plants they will generally take up the water so readily that it will seldom do harm, even should you by mistake fill the bed with water to saturation. Prof. Green says he has never injured plants in that way; but, of course, they are careful not to give their sub-irrigated beds too much water. I have been experimenting for two or three years past; and I have about come to the conclusion that, for *real high-pressure gardening*, at least, to have it carried right along through intense drouth and drying winds, I want a water-tight bed so I can let the water in and fill it all up from one side to the other, and from one end to the other, even if the bed be 50 feet long. When you are prepared to do this you can smile at the drouth. Perhaps I should add, that, in making strawberry cuttings, we want a cloth covering to modify the intense glare of the sun's rays, and especially in the case of cuttings to keep the air over the plants moist as well as to keep the earth beneath them moist. With the water-tight bed and cotton sheeting above the plants, then we are independent of the

over the steam-pipes, it was too hot, while the outside edges of the bed were too cold; so we had frozen strawberries and baked strawberries almost side by side. Well, this new sub-irrigation suggests a remedy. We have been having two or three beautiful days after our young winter; and I am improving the time by having the dirt all dug out of the bed, clear down to hardpan. The bed, you remember, is 6 feet wide and 50 feet long. When this was done, I put in some oak sills (2x3), running cross-wise of the bed, about every 3 feet. On these oak sills were placed hemlock boards, 10 inches wide, leaving room between them to shrink and swell.

A few months ago a tin roof was to be replaced. The old one was going to be dumped off somewhere outdoors. I had it put in one of our spacious basements until it should be wanted; and when I read Bulletin 61, the old tin roof struck me as being just the thing for the bottom of my bed. Strips were cut from it 7½ feet wide, and as long as we could get them. This permitted turning up the sides, a little more than 6 inches high. These tin sides were tacked to the plank that supports the glass sashes. As the tin roof was old, there were some leaky places in it. To make it tight we covered it all with about half an inch of cement made of three parts of sand and one part of Akron cement, and two lines of tile were put the whole length of the bed, right along the bottom, each line 18 inches from the outside of the bed. This would make the two lines of tile just 3 feet apart, so that the water has to go only 18 inches through the joints of tile each way, to saturate the whole bed. The tiles were also laid in cement, the joints being cemented half way up. Before filling the bed with dirt it was all sifted to make it fine and loose, some fine manure being incorporated at the time the sifting was done. After the earth was put back in the bed, then we dug down on the outside until we struck the ends of the oak sills before mentioned. This allowed the heat from the center to work out each way along under the tin. Then an extra side-board was put along each outside, with a two inch space between the original plank composing the bed and the outer weather-board. This space permits the hot air from beneath the bed to pass out each way and up around the sides of the bed, protecting the sides from frost, and preventing the center of the bed from getting so much heat. The diagram below will help to make it plain:

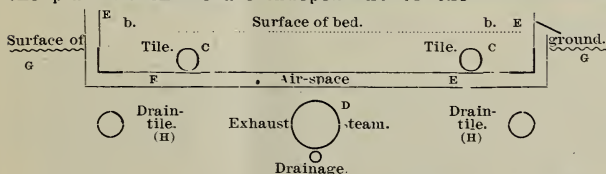


DIAGRAM OF A HOT-BED HEATED BY EXHAUST STEAM.

greatest heat of summer; and by replacing the cotton with glass sashes, and having beds warmed by exhaust steam, sent through tiles, we are also independent of zero freezes.

To-day, Dec. 18, we have been very busy in introducing sub-irrigation into one of our fifty-foot beds that lies over the steam-pipe between our dwelling and the factory. It is the one I gave you a glimpse of in our issue for April 1, 1894, page 271, where I raised the strawberries, you remember. Last winter, during the exceedingly cold weather, they were obliged to send such a volume of steam over to the house that we had cooked strawberries grown in the open ground. In the center of the bed, right

CC represents the sub-irrigation tiles resting on the tin bottom; EE the air-space under the tin bottom and up the sides of the bed. The sashes are supported on the edges of the inner bed EE, as shown in the diagram. When a heavy rain comes on the sashes, it would run down into the air-space E, on the south side. To prevent this we have fixed a strip of board just below the letter E, put on a bevel over toward the word "ground." The object of this board is to make a sort of eaves to run the rain water outside of the bed. In every arrangement of this kind there must be ample drainage. In fact, exhaust steam can not do its work if the large tile which conveys it should get flooded with water during excessive ice-cold rains in winter. To make sure this can not happen, we have a line of drain tile, HH. These, however, should be up high enough to be near the corners of the bed, as shown in the cut. Besides these, underneath the large tiles to carry the exhaust steam is another drainage tile. This also car-

ries away the drip from the condensed steam, and *must* have a good outlet. By the way, this drainage outlet will also be warmed up all its length by the hot water; and we have quite a pretty hot-bed near the evergreens warmed entirely by the hot drip water from the condensed steam.

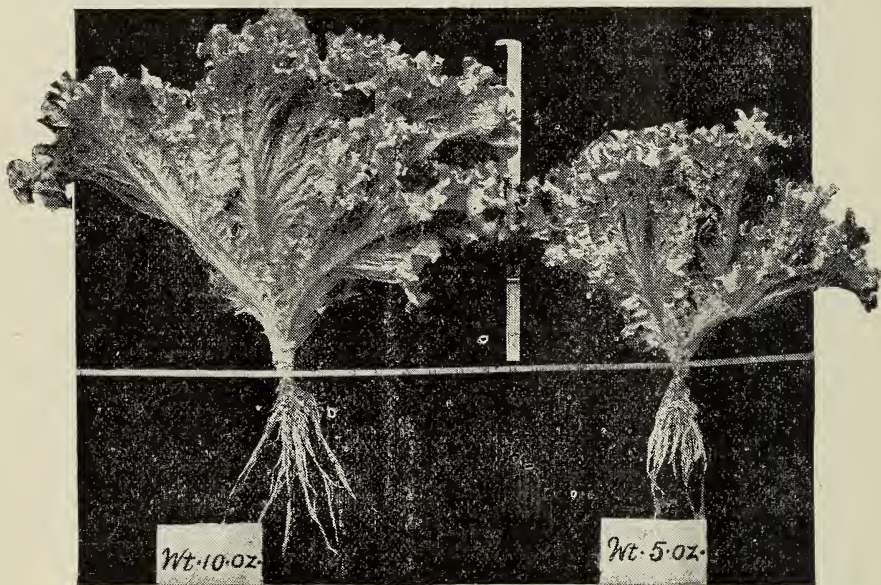
My impression is, that all hot-beds heated by exhaust steam passed through tiles should have this sort of arrangement, or something equivalent, to prevent heating the center of the bed too much, also to prevent the sides of the bed from getting too cold; and I think any hot-bed or cold-frame would be greatly improved by double boarding, and having an air-space between the boards. With such an arrangement there would be much less need of extra covering, such as shutters or straw mats, over the sash during very severe weather.

Now, then, if you visit me in February or March I think I can show you some strawberries that are neither cooked nor frozen. Very likely it would be better, in arranging beds 6

is for. I wrote them that I considered Bulletin 61 worth its weight in gold to a lettuce-grower.

THE CELERY MARKET.

All of the celery farms in our vicinity are sold out. Most of them disposed of their own crop some weeks before Christmas time. We were finally obliged to send to Cleveland to get celery for Christmas. Last evening, Dec. 24, a single box came by express. It cost 50 cts. per dozen roots, and the dozen weigh $5\frac{1}{2}$ lbs. With the enormous increase in acreage that has been put in every year in our locality, I have been thinking all along that the celery business would soon be overdone; but here it is, not yet Jan. 1, and very little celery is to be found at *any price*; and when you do get it it costs more than 4 cts. each for a single root; and these roots, when trimmed up, weigh on an average less than 8 oz. each. Hadn't you better get some celery seed and start it in a box in the window—that is, providing you have no better place? That bright little book, "Celery for Profit," by T.



GROWN BY SUB-IRRIGATION.

GROWN BY ORDINARY SURFACE WATERING.

GRAND RAPIDS LETTUCE.

feet wide, to be warmed by exhaust steam, to have *two* lines of tile to convey the steam. But even with this, I think there should be double walls. Why is not my arrangement sub-irrigation in the open air? It is sub-irrigation in the open air; but beds made on this principle must be covered with sashes during a very severe rain. If not, this tin-bottom water-tight hot-bed would get soaked full of water, and the plants would be all drowned. You may suggest that an arrangement should be made for letting off the water during a very wet time. Yes, we have done this; but when we put such quantities of valuable manure into a bed it does not pay to let the water run off so as to leach out the strength of the manure, much in the same way you would leach ashes in order to get lyé!

By the kindness of Profs. W. J. and E. C. Green it is also my privilege to give you the best picture of Grand Rapids lettuce that ever appeared in print. The engraving above was taken from the above bulletin. The title under the cut fully explains what the picture

Greiner, is, now in its fifth edition. The new edition is just out, and a big lot of the books are piled up on our counter. If you have any notion of raising celery, even a patch in your own garden, it will pay you to have the book. The price is only 25 cts., if sent with other goods, or 30 cts. if sent by mail.

We are now selling beautiful spinach—in fact, the finest I think I ever grew. It went through the freezes during the fore part of December without harm. We managed to have it just about as large as it could be without running up to seed, when winter set in; and during the very warm rains just before Christmas it has made a tremendous growth. We get 5 cts. for a 1-lb. package. We are also having quite a little trade in watercress grown in a *sub-irrigated* bed in the greenhouse. We get a nickel for a 2-oz. package. This package is put up in a little paper bag, just so the tops show above the paper. These bags of cress are then packed in a market-basket. Some of our customers, who used to be fond of watercress in their childhood

say that it just "hits the spot" at this season of the year better than any other vegetable. We are rather behind with our Grand Rapids lettuce; but a neighbor of ours who has a greenhouse has supplied us, and we both together have been having quite a brisk little trade on lettuce for Christmas.

NEW POTATOES BY CHRISTMAS.

You may remember I told you on page 819 that we planted some of Maule's Thoroughbred potatoes in the greenhouse, Oct. 22. The potatoes have been so recently dug that it took them some time to germinate. The first sprouts were noticed above the ground Nov. 11 (20 days later); and in our last issue I think I told you they were 6 in. high. Well, to-day (Christmas) I saw some of the largest stalks stood up over a foot high. A potato-plant, where it is entirely protected from insect-enemies, is very pretty. The leaves are very bright and glossy. With outdoor culture, where almost every leaf one can find is perforated by that mischievous flea-beetle, you rarely get a glimpse of potato-leaves as they should be. These in the greenhouse are perfect; and if you try some in a hot-bed or even in the window I think you will agree with me that they are a very handsome plant. Well, while I was admiring the foliage, especially the great stout stalks, and noticing their rapid growth, I saw the ground was a little bulged up and breaking open by one of those sturdy plants. Is it possible, thought I, that *potatoes* can be forming already? Then I pushed the dirt away with my finger. Sure enough, there was a beautiful white new potato, half the size of a hen's egg, and big enough to cook. I verily do believe. New potatoes in 65 days after planting, or 45 after they were up! So the experiment may be said to be settled, that rare and valuable varieties of potatoes can be grown under glass. We are making preparations to fill all our greenhouses and hot-beds. The potatoes will be planted to one eye, and only a foot apart; but this new potato ripens up so quickly that I think they will stand this close planting. New subscriptions have come in until the first barrel is about gone. At the present rate we shall give away all that are not used in planting on our own premises, long before planting-time. When we get to putting them outside in hot-beds and cold-frames we shall use shutters over the glass, and cover up the space between the paths so as to keep out the frost.

MORE ABOUT MAULE'S NEW THOROUGH-BRED POTATO.

From the *Practical Farmer* of Dec. 7 we take the following, by H. F. Smith:

About the middle of April last I received by mail from Wm. Henry Maule, seedsman, Philadelphia, a potato weighing about one-fourth of a pound. This was accompanied by the statement that, if I felt disposed, he would be pleased to have me test it, saying that it was a new one that came highly recommended, and that he thought of offering it to his customers next season. Whether he wished me to test it by eating or by planting he did not say; but as he said, "Label it No. 17," I concluded that he wished me to plant it; so I put it away with several samples I had stored for that purpose till it was time to plant. I have made such tests of new varieties with some of the best sorts I had on hand, every year for several years, for my own benefit, finding it a good way to determine the relative merits of the different varieties when raised under the same conditions of climate, soil, and cultivation. I plant and treat in the same manner that I do my general crop, so that I may know by the result just what I may expect them to do with me. I have found that new and improved varieties invariably yield the best, and also that there are comparatively few kinds that can be raised at a profit. To be profitable, the variety must have vigor to insure a good yield, and be of the best quality to command a sale.

Unless it combines these qualities it should be discarded at once. The length of time required for it to mature, its shape, color, and keeping qualities must also be considered in fixing the value of a new variety.

May 10th, when my field was ready to plant I selected two rows together for my trial plot. Here I planted two tubers each of 54 different varieties; but having only one of No. 17 I divided it into 12 pieces having one eye each. These were dropped about 18 inches apart in the drill. I knew that this would be a severe test for any new variety, for I had several of the very best sorts with which it was to compete, but I wanted to know just what to expect of it hereafter. The trial plot was prepared and treated in all respects just the same as my general crop of Freeman, which yielded about 1200 bushels on five acres of land. During the season of growth I observed that the little red potato was holding its own, in appearance at least; and on August 23d, at which date I harvested the crop, the vines were ripe and dry. As I dug one kind after another, carefully weighing each and noting the result, some yielding thirty-fold, some sixty, and some a hundred, I hardly expected the unacclimated, nameless little stranger would equal the best. But as I counted the tubers from the 12 hills, large, smooth, and bright, 112 in number, I saw at once that I was handling something valuable; and when I placed them on the scales, and they tipped the beam at 31½ pounds, showing a yield of 126-fold, and at the rate of 733½ bushels per acre, I thought that surely no one would test them by eating one of them this year. I weighed them over again, then counted them again, and then weighed them in parcels. One weighed 17 ounces, and ten of them weighed 8½ pounds. The yield on the whole plot was at the rate of 341½ bushels per acre. I at once decided that No. 17 was a well-bred potato, and if it is introduced next year I am sure it will make for itself everywhere a wonderful record. Mr. Maule has just informed me that he has named it "Thoroughbred," and it well deserves such a name. Since reporting the result of my test to Mr. Maule I have seen what Mr. Terry says in the *Practical Farmer* about his test of the same variety, and that it did nearly as well with him as it has done with me.

The editor of the *Practical Farmer* adds:

As Mr. Smith is the originator of the now celebrated *Polaris* potato, the above account is made doubly interesting, supplementing as it does Mr. Terry's remarkable experience with this new potato.

Permit me to add that the above test, and the one made by T. B. Terry, are, both of them, where this new potato was given just the same cultivation given the rest of the whole field; that is, they were not put in a very rich spot in the garden, and given extra care and attention, as is often or usually the case with a new variety. You will notice the whole plot in friend Smith's experiment gave 341½ bushels to the acre. This of itself would indicate that both variety and cultivation must have been a little more than ordinary; but this new comer, taking its chances with the rest, went up to the enormous yield of 733½ bushels per acre. Don't you think, my friends, you had better have at least a pound yourself, to experiment with? The probabilities are very strong that every potato raised of this variety next season will be worth a big price.

A POTATO REPORT, ETC.

We bought twenty eyes of Craig potatoes from Christian Weckesser, Niagara Falls, in April last. We planted them, and they all started but one. They grew nicely till hot dry weather came, when the tops seemed to blight some; but after a while they started out fresh and green, and grew till frost cut them down. We had 32 lbs. of good-sized potatoes. We also grow Freemans and Rural New-Yorker No. 2. The Freemans don't do well; they blight badly; still, I like them so well on the table that I guess we shall try them another year.

The Rural New-Yorker turned out splendidly, giving us 130 bushels of good large potatoes

from 64 rods of ground. Nearly every one says they were the best crop grown around here.

We have about a dozen hives of bees. There has been lots of foul brood around here; but when Mr. McEvoy, the inspector, was here he said ours were not bad, except three of them. We did as he told us to do, and hope when he comes back they will be found all right.

MRS. W. H. WESTCOTT.

Falkirk, Ont., Can., Dec. 23.

Special Notices in the Line of Gardening, Etc.

By A. I. Root.

The Thoroughbred potatoes over in the greenhouse are to-day, Dec. 31, over a foot high.

I now weigh 127 lbs.—only 3 lbs. short of my usual weight. My digestion is just perfect so long as I stick to lean meat and zwieback, and do not get in too large a ration of baked apples.

OUR LIST OF SEEDS FOR THE GARDEN, FARM, AND GREENHOUSE.

This was crowded out of this issue, but will, without doubt, appear in our next. If you send in an order we will give you the advantage of the reduced prices.

Homes and Neighbors also seemed crowded out of this issue, but I think the friends will find more or less of both scattered through my talks and travels.

THE FREE SAMPLE PACKAGE OF SANITARIUM HEALTH FOODS.

We have given away a hundred of these, and have just received another hundred for free distribution. The sample packages include one each of granose and granola, with directions for cooking; also a small package of caramel cereal, a substitute for coffee that is not a stimulant, but, on the contrary, aids digestion. These will be put in express orders or freight orders, entirely free of charge. Where wanted by mail, send 10 cts. for postage and packing. If you like the samples, you can order the articles with other articles when you are making orders here, or you can order direct from Battle Creek, Mich. As a rule it will not pay to order these things by express; neither will it pay to order them by freight unless neighbors club together so as to buy 30 or 40 lbs. or more in one purchase.

SEED POTATOES THAT HAVE BEEN FROSTED.

There has been considerable discussion as to whether potatoes would grow or not if they have been slightly frosted. The best way to settle it, especially if they are valuable, is to put them in a warm place, and see if they will sprout. The way we do it is to put them in a warm place in the greenhouse, say under one of the beds. Put the suspected potatoes close together, one layer deep. Sift over them some fine earth. If they commence to sprout, all right; but if they don't—why, they are worth something for manure, and they are right where you can shovel them up, dirt and all, any time you want some fertilizer. We have repeatedly raised some very fine potatoes where the seed seemed so soft that it was apparently good for nothing.

JAPANESE BUCKWHEAT FOR SEED.

With the large crops raised during the past year, we are able to give better figures than ever before; viz., trial packet, $\frac{1}{4}$ lb., by mail, 5 cts.; 1 lb. by mail, 15 cts.; by freight or express, peck, 25 cts.; $\frac{1}{2}$ bushel, 50 cts.; bushel, 80 cts.; two-bushel bag, \$1.50; 10 or more bushels, purchaser paying for bags, 65 cts. per bushel. Please remember it does not pay as a rule to order buckwheat any distance by express, as the charges will be much more than the value of the seed. If you want only a small quantity, better have it by mail. Half a bushel or more can be sent safely by freight; but where the distance is very great, it had better be ordered with other goods, or even the freight may amount to more than the value of the buckwheat. Our eight-page buckwheat circular gives a vast amount of information in regard to buckwheat cultivation, and will be mailed free of charge on application.

SEED POTATOES BY MAIL.

We have special facilities for packing and mailing every thing of this sort; and this, perhaps, enables us to send potatoes for planting, by mail, cheaper than almost any other seedsmen. If you compare our prices with those quoted in most of the seed catalogs you are now getting, you will see how reasonably we are willing to work for you. I believe that, as a rule, it pays better to send whole medium-sized potatoes by mail than to undertake to send eyes only, especially where they are to go long distances. We can furnish small potatoes whenever they are wanted. You will get more eyes in a pound of small potatoes, but they will not ordinarily make as strong growth. We will send 1 lb., postpaid, for 12 cts., of any of the following varieties: State of Maine; Beauty of Hebron; Rural New-Yorker No. 2; Monroe Seedling; Puritan; Early Ohio; Lee's Favorite.

For 15 cts. per lb., or 3 lbs. for 35 cts., we will send New Queen; Sir William; Freeman; Burpee's Extra Early; Livingston's Banner State.

For 20 cts. per lb., or 3 lbs. for 50 cts., we will send Carman No. 1 or New Craig.

Maule's Early Thoroughbred will be \$1.50 per lb., or 3 lbs. for \$3.00; but any one who is now a subscriber to GLEANINGS may have 1 lb., postpaid by mail, as a premium for getting us one new subscriber, sending us, of course, \$1.00 for the new subscriber. For particulars in regard to this last offer, see our potato circular.

SEED POTATOES BY THE BUSHEL FOR JAN. 1, 1896.

State of Maine, 25 cts. per bushel; Beauty of Hebron, 35 cts. per bushel; Rural New-Yorker No. 2 and Monroe Seedling, 40 cts. per bushel; Lee's Favorite, 60 cts. per bushel; New Queen, Freeman, Burpee's Extra Early, 75 cts. per bushel; Sir William, \$1.00 per bushel. The above figures do not include package to ship in. Packages for shipping will cost as follows: Jue bags, holding 2 bushels, 10 cts. each. These are not suitable for cold weather. Better have them put in a barrel, for this will give room around the potatoes so as to put in paper and packing enough to make them pretty safe to go, even in cold weather. Price of a barrel holding 11 pecks, 25 cts. We ship choice seed potatoes more or less all winter long; and where they go toward the South we seldom have any losses unless a terrible freeze sets in such as we had during the latter part of last winter. I do not remember that we ever had any potatoes frozen when sent by express. But that is expensive work unless it is for some choice high-priced potatoes. If any of our friends wish us to undertake to ship them in winter, we will do our best to get them through safely. We can not, however, take all the responsibility of loss from freezing, as a rule, until after April 1.

For a full description of our seed potatoes, including prices on the new Craig, see our special potato circular, mailed free on application.

NEW AND VALUABLE RURAL BOOKS.

First we have a new edition of "Onion Raising," by Gregory. The chapter on keeping onions and onion-sets over winter by freezing has been worth to me much more than the price of the book. In fact, I had been drifting toward the plan for several years. It is, briefly, this: Place the onions on the barn floor to a depth of about 20 inches, having the heap at least two or three feet from the side of the building, the space being packed in with fine meadow hay, and putting twenty inches or more of hay or straw over them. It is well to have boards around the edge of the bed to keep the onions together. They must not be handled in the spring before the frost is entirely out, uncovering them in the spring gradually so as to let the frost come out slowly. A floor somewhat protected underneath would be better—say a floor over the stables. Put the sets in open crates, and let them freeze, and then cover them with 18 inches or 2 feet of hay or straw. Pack it all around them so well that they will not warm up and sprout out at every mild spell during winter, and just let them alone till time for planting. Don't put any blankets over them, nor any thing of that sort, for it will make them sweat and sprout. Briefly, freeze them up and then cover them so they will keep frozen all winter; and do not suffocate them and make them heat and sprout. The price of the book is 25 cts.; by mail, 30 cts.

CELERY FOR PROFIT.

This book I have mentioned in another column.